THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Three statements give the situation in the main: Foundry pig iron is weaker and buyers are waiting for the market to settle further before taking hold. Steel making pig irons are strong, with good demand. Finished material in all lines is quiet, but without weakness. This is not the first time in the present long run of prosperity in iron, when foundry iron has been out of harmony with other lines, and the causes in this instance are not obscure. For months buyers have been out of the market except as failures of deliveries on contracts or temporary increase in demand for castings has compelled buying. Increasing production of pig iron and marked improvement in freight facilities have demonstrated that foreign iron is no longer needed and that requirements will be more than supplied by domestic furnaces. The discrimination of $1 a ton on Southern iron prices, in favor of Eastern buyers, is practically ineffective today, and while there has not been business enough to tempt association furnaces to change their own schedule there have been sales of No. 2 iron at $16.50, Birmingham, by outside interests to Central Western melters, and this price does not appear to be absolute minimum. The possibility of a new and uniform price by the associated Southern sellers is already being discussed. It does not appear, with all the weakness and halting in foundry iron, that melters are now doing less business than in the past year or expect any falling off. The contrary is true in very many instances. What is likely to happen is that a very large number of foundries will be in the market at the same time within the next two months. The price of Northern iron has declined within the month, and $20 for No. 2 at Northern furnace is now possible for the second half. Middlesboro iron is weaker in the East, $17.75 ex-ship having been done. German iron also is lower, and there is some discussion of probable cancellations on existing contracts for foreign iron. The market for steel-making pig iron does not show the weakness of foundry grades. Pittsburg reports about 50,000 tons of Bessemer and basic iron sold in the past week, including a considerable tonnage for May, June and July, on the basis of $19.90 to $20.15 at Valley furnace for the earlier deliveries. Steel works are all short of metal and the outlook is for an active market for both Bessemer and basic irons. Steel is scarce and a considerable inquiry is reported which is thus far unsatisfied. Domestic Bessemer is quoted $31.50 and even higher, at Pittsburg, with little obtainable. Foreign steel could be sold in round lots if deliveries were possible in the next three months. Light sales have been made at about $29.50 on dock at New York, but demand for 30,000 tons that has come to one importing firm cannot be taken care of. It is evident that some German makers are oversold, and their own home demand has increased. It is not likely that much if any basic Bessemer can be bought for delivery prior to September and some makers have nothing but fourth quarter steel to offer. In general the finished material market has been affected somewhat by the wait in pig iron, and it is expected that buyers, as in agricultural machinery lines, who usually buy for a year, will follow the market for a time and place smaller orders. The bar mills are not likely to have the large tonnage booked ahead in the coming year that they have been accustomed to; yet there is no good ground for expecting a change in the price of steel bars for months, in view of the demand for every pound of ingots now produced, for one finished form if not another. Rail mills are asked for vastly larger summer tonnages than can possibly be rolled. Demand for wrought pipe is very heavy. In addition to the requirements already referred to for Western Pennsylvania lines, it is reported this week that 34 miles of 6-inch pipe for the Beaumont field and 100 miles for Joplin, Mo., will beneeded, in addition to a large tonnage for a line from West Virginia to Pittsburg.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
439 PARK BUILDING, April 29.

(Special Telegram.)

Steel-making pig is more active than for some time. About 50,000 tons of Bessemer and basic have been sold this week, the bulk being for May, June and July delivery, but some tonnage running clear through the year. For May and June prices ranged from $19.90 to $20.15 in the Valley; for second half alone, $19.55 and possibly $19.50, Valley, was done on standard Bessemer. Several leading steel works have been short of pig and are likely to buy more. The outlook for Bessemer pig is decidedly more favorable, as against a poorer outlook for foundry pig.

No further sales of German steel are reported and it does not seem possible to get any before August shipment, possibly not then, German consumption being much heavier.

Conditions in the iron trade are decidedly mixed. Foundry iron is easier, chargeable not to increased offerings, but to abnormally light demand, while steel-making pig appears firmer. Steel continues very scarce, with fancy prices paid for prompt delivery, but very little disposition to contract for the late months of the year. Finished materials are firm but quiet, with sheet metal products showing an advancing tendency, while scrap is very quiet, and shows signs of going lower.

The Pipe Machine & Mfg. Co. has announced an advance of 10 percent in eavestrough and conductor pipe, following an advance of 5 percent made late in March. The exact list of new discounts has not been promulgated yet, although the general fact of the advance was announced last Friday. The new discounts, for central territory, will be about 72½ percent off on pipe, nested, 70 on pipe not nested, and 78 on eavestrough, all to dealers in less than carload lots. A carefully prepared list of jobbers receive a further discount on carload lots.

Pig Iron.—Influences in the pig iron market are pulling both ways. All the steel works must buy more or less Bessemer or basic for second half, and are showing an increasing tendency to come into the market. One large interest, east of Pittsburg, has started making tentative offers on a much smaller tonnage than it will need, and will likely buy within the next fortnight. We note a sale of 3,000 tons of Bessemer at $21, Pittsburg, or $20.15, Valley, which would indicate a decided advance, were it not that deliveries begin with June, running through the year, and it cannot be figured how much of the price paid is a premium for the June delivery. Southern forge is firm at $19.85. We note a sale of 1,000 tons of prompt at this price this week. Southern foundry, however, is a shade easier, and the official price of $21.35 for No. 2, delivered, Pittsburg, can be shaded 10 cents a ton and possibly more. It develops that as low prices can be made on Southern foundry for prompt as for future shipment. The advance of a dollar a ton for Western shipment over Pittsburg and the East, which the Southern furnace association attempted to establish, is a dead letter, consumers looking with decided disfavor on the attempt to establish such an unusual practice. There is scarcely any demand for foundry iron, either Northern or Southern, owing to foundries not being so well filled with work

as formerly, and having a molders' strike confronting them. In limited quantities Northern foundry No. 2 for early delivery could be had at $21.50 or $21.75, although an urgent buyer might have difficulty in finding any considerable quantity. We revise quotations as follows:

Bessemer, Valley	$19 65 to 20 65
Bessemer, Pittsburg	20 50 to 21 50
No. 1 Foundry	22.25 to 22 50
No. 2 Foundry	21 50 to 21 75
Gray Forge, Pittsburg	19 85 to 20 35
Chilled Basic, Valley	20 00 to 20 50
Chilled Basic, Pittsburg	20 85 to 21 35

Steel.—Small lots of billets and slabs continue to bring very good prices, and the demand is quite active from various finishing mills, but is confined to early delivery. Bessemer billets are quoted $31.50 to $32, Pittsburg, for quick shipment, while $31 at Youngstown mill can probably be done, but the plant in question will be shut down July 1 for installing a new billet mill, and the supply for outsiders will presumably be shut off considerably before this time. Open-hearth steel is 50 cents to a dollar above Bessemer, for early shipment.

Ferro-Manganese.—The English ferro has the advantage now, German mills quoting higher, and we quote English at $50 in large lots and at $52.50 in small lots, delivered to buyer. Domestic is not offered at all, the regular producers being occasional buyers of foreign themselves.

Muck Bar.—Muck bar is a shade easier, and we understand $35 has been done, although most mills quote $35.50. There is not a great deal to be had, but demand is quite light.

Skelp.—The skelp market is about closed, as producers are sold up through this quarter. Odd lots can be picked up at from 2c to 2.15c.

Rails and Track Material.—Edgar Thomson is rolling the urgent rail orders which had been entered at the Youngstown mill, but less urgent orders wait the changing of the mill from billets and sheet bars back to rails, which can probably be done by July 1. We quote: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 8 pounds in carload lots, $39; less than carload lots, $40; 12, 16 and 20 pounds, $36; 25 to 40 pounds, $36. Track materials: Spikes, 2.15c to 2.20c; track bolts, square heads, 2.05c; hexagon heads, 2.65c; fish plates, 1.60c on orders accompanying large rail contracts, otherwise 2c to 2.10c is asked.

Plates.—There is a fair scattering demand for prompt plates, on which the mills are getting premiums of from $3 to $5 a ton. They are taking care of old customers wherever possible at the official price, but can take very little tonnage for six months or more. We repeat official prices as follows: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.75c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plate more than 100 inches, 5c extra 100 pounds. Plates 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

Bars.—Only ordinary current business is being booked in steel bars, there being no incentive to place contracts. The steel bar mills are not running as full as they could if they had the steel and more orders, but there is no disposition to shade prices, as makers have ample outlets for their steel product. Mills are well sold up for several months on iron bars, and are not pushing sales for summer delivery. We repeat quotations: Bessemer steel bars, 1.60c; open-hearth 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer under 3 inches, 1.70c; over 3 inches, 1.80c; bar iron, 1.80c to 1.85c, Youngstown, or 1.84¾c to 1.89¾c, Pittsburg, with freight added to point of delivery from Youngstown. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

Structural Material.—The structural iron workers' strike in Pittsburg was settled last week and the men have returned to work. None of the points struck for were conceded, it is understood, although there is a lack of official information from either side. The prospects of a general strike throughout the country have been minimized by the developments here. Mills are filled up tight on structural to July and have nearly their entire capacity sold for the remainder of the summer. We quote as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

Pipes and Tubes.—Pipe is very firm, as producers are all very well sold up. Transactions are not very heavy, but premiums are frequently secured on steel pipe for early shipment. Independent mills are holding to their own discounts on iron pipe. We quote official prices as follows, in carload lots to consumers, f. o. b. Pittsburg, plus freight according to Tube Rate Book to destination:

MERCHANT PIPE.

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Wrought Iron Pipe. Black. Percent.	Wrought Iron Pipe. Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inch	75	65	72	62
7 to 12 inch	69	59	66	56
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Cut 3 to 6 feet				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
¾ to 6 inch	71	60	68	57
7 to 12 inch	65	53	61	50
Cut 6 feet and longer				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
¾ to 6 inch	72	61	69	58
7 to 12 inch	66	54	62	51
Extra Strong Plain End				
⅛ to 8 inch	67	57	63	53
Threads only	66	56	62	52
Threads and Couplings	65	55	61	51
Double Extra Strong Plain End				
½ to 8 inch	59	49	55	45
Threads only	58	48	54	44
Threads and Couplings	57	47	53	43

NOTE.—Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.

Steel.

	Percent.
1 to 1½ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	52½

Iron.

	Percent.
1 to 1½ inches	36½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	35½

CASING.

	S. and S. Percent.
2 to 3 inches	58
3¼ to 4 inches	60
4½ to 12½ inches	63

Sheets.—There are again rumors of an advance in sheets, this time in galvanized, but such reports are unfounded. The leading interest has not changed its prices, but is filled up quite full for some time to come, and independents are all quoting premiums, although it is possible the base prices might be made on a favorable short time contract with a good customer. On carload lots 2.80c to 2.85c represents the bottom of the market, and on galvanized 3.85c to 3.90c, from mill. We quote on contract as follows: No. 28, 2.75c; No. 27, 2.65c; No. 26, 2.55c; Nos. 22 and 24, 2.45c; Nos. 18 and 20, 2.35c; Nos. 14 and 16, 2.25c; Nos. 10 and 12, 2.10c to 2.15c. Galvanized: No. 16, 2.60c; No. 18, 2.85c; No. 26, 3.35c; No. 27, 3.60c; No. 28, 3.85c; No. 29, 4.35c; No. 30, 4.50c.

Wire and Wire Nails.—Wire nails are not moving as freely, as the season of heaviest demand is nearly over, but prices are very firm for both nails and wire products generally. We quote: Wire nails, carload lots, to jobbers, f. o. b. cars, Pittsburg, $2; plain wire, carload lots, $1.90; barb wire, carload lots, $2.30; staples, carload lots, $2.20. Galvanizing, 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $2.15, and less than carload lots, $2.20, f. o. b. Pittsburg, plus freight to point of destination. Iron cut nails are $2.25 in carload lots and $2.30 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

Merchant Steel.—There is nothing new to report in this line. We quote: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots; tire steel, 2.15c to 2.25c; spring steel, 2.25c to 2.35c; toe calk, 2.30c to 2.40c. The following differentials maintain:

Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Tool steel is quoted 7 cents and upwards, according to the grade.

Spelter.—The market is somewhat higher, and a general strike has been inaugurated at one of the leading St. Louis smelters, this interest now refusing to quote. We quote the market unsettled at 5.65c to 5.70c, Pittsburg.

Old Material.—The market has been very quiet, and may possibly go lower, but dealers have been confronted with a scarcity for so long that they are not disposed to loosen up. Foundries have been very poor buyers for some time, but have taken scrap on contracts without delay. We repeat quotations (all gross tons) but would note that in the absence of heavy transactions they are partly nominal: Heavy melting stock, $21.50 to $21.75; low phosphorus melting stock, $25 to $25.50; steel rails, $21 to $21.25; re-rolling rails, $22.50 to $23; No. 1 cast scrap, $19 to $19.25; borings, $11 to $11.50; busheling scrap, $17.50 to $18.50; old iron rails, $24.50 to $25; turnings, $15 to $15.50.

Coke.—The whole coke situation is now eased up, and fancy prices for spot have disappeared, while on contracts $3.50 can be done on furnace and $4.75 on foundry, at ovens. While the coke movement is now entirely satisfactory, there is a possibility of trouble within the next 30 or 60 days, when the ore season is on in full force, and furnaces are disposed to watch the situation closely. For the week ending Saturday, April 18, the output of the Upper Connellsville region was 249,025 tons, and of the Lower Connellsville region 52,000 tons.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK, April 28.

This continues a dragging market, buying of both raw and finished products being full and featureless. The conditions in the iron and steel trade in this city are of a somewhat anomalous character, inasmuch as there is a good demand for materials on which mills are sold several months ahead, while for material which can be shipped promptly, there is scarcely any demand at all. Illustrations of this state of affairs are ample. An Eastern producer of rails reports that on orders and on inquiries from all its offices summer delivery is wanted on 500,000 tons of standard sections, but only a very small portion of this amount can be shipped as wanted, owing to the crowded condition of its mills. The Chicago office of this company sold last week about 5,000 tons of rails, and this closes its mills for any delivery prior to Nov. 1. The billet situation is another case in point. A local importer has inquiries for German basic Bessemer billets aggregating 30,000 tons, of which one-half is from the West, all for quick shipment; the major portion of the above, however, will have to be refused because the earliest delivery which can be made from German mills is in August. Sheets and plates are extremely active, but the difficulty experienced by independent producers in getting sheet bars and the uncertainty regarding their future supply has had a discouraging effect on sales; while plate mills are sold up for practically the entire year, such business as is accepted coming almost entirely from old and favored customers.

For wire products and the heavier sizes of merchant pipe, there is a brisk call, and mills are unable to meet the demand for same. Bids have been asked on 34 miles of 6-inch pipe for Beaumont, Texas, and on 100 miles of line pipe and casing for Joplin, Mo., all of which is expected to be laid before the cold weather sets in. The demand for pipe of the smaller sizes is very limited, due to labor disturbances in this and other cities.

Independent producers in this country who have in a measure depended on the foreign market for their supply of raw material, are in danger of having this supply cut off, as is evidenced by the following excerpt from a report on the European situation, written by a large jobber on the other side: "A good many of our local friends have misjudged the market in so far that they have suddenly found themselves short in a rising market. Then again, in Germany, the makers have misjudged the position and have oversold themselves for export with the result that they are unable to cope with the domestic demand where, of course, a much better price prevails than for export. We are informed that one of the principal wire works in Germany had difficulty in securing sufficient billets to keep their works going during the month of May. Our opportunity for purchasing during the third quarter of the year has practically gone, and it is the last quarter of the year we need now to deal with."

Pig Iron.—Foundrymen have shown no greater inclination to place their orders in the week under review than during several weeks previous. Most of them are content to wait until the market shows greater stability or prices go lower, and in the meantime they are buying only for current needs. These are covered in the shape of occasional car-load orders, with a sprinkling of 100 and 200-ton lots, which in the aggregate make a respectable tonnage, as figures go in these days. Salesmen who have returned from trips in territory contiguous to this city, report that conditions in the country are the same as in the city, and that melters all over the West are pursuing a waiting policy. This inactivity has resulted in keen competition for the business that is being placed, and $16.50 for No. 2 foundry at Birmingham is a quotation that is no longer made in a suppressed tone of voice, though association furnaces still report they are holding strictly to official prices. We have revised our quotations on Northern iron, which are 50 cents lower, and quote as follows:

Lake Superior charcoal	$24 00 to 25 00
Local Coke Foundry No. 1	22 00 to 22 50
Local Coke Foundry No. 2	21 50 to 22 00
Local Coke Foundry No. 3	21 00 to 21 50
Local Scotch Foundry No. 1	22 00 to 22 50
Southern Coke No. 1	21 35 to 22 35
Southern Coke No. 2	20 85 to 21 85
Southern Coke No. 3	20 35 to 21 35
Southern Coke No. 4	19 85 to 20 85
Southern No. 1 soft	21 35 to 22 35
Southern No. 2 soft	20 85 to 21 85
Southern Gray Forge	19 85 to 20 85
Southern Silveries (4% to 5% silicon)	22 85 to 23 85
Southern Silveries (5% to 6% silicon)	23 35 to 24 35
Jackson Co. Silveries (6% to 8% silicon)	20 30 to 20 30
Ohio Strong Softeners	24 00 to 24 50
Alabama and Georgia Car Wheel	28 35 to 29 35
Malleable Bessemer	22 00 to 23 00
Standard Bessemer	22 50 to 23 50
Basic iron	22 35 to 22 85

Bars.—While the demand for both iron and steel bars has been heavier in the past week, it is yet not what it should be. There is no concerted contracting movement among consumers, who are buying as their wants dictate and in the majority of cases for deliveries three and six months ahead. The past year has been a bad one for manufacturers of windmills, carriages and wagons, and of certain kinds of farming machinery, and many of these concerns will carry over good sized stocks. Some implement manufacturers report that their requirements in the coming year will be nearly double those of last, and a few large contracts for steel have been closed in the past week, but concerns that have reports of this kind to make are in the minority. There is little demand for hoops owing to strikes among coopers. We quote mill shipments, Chicago delivery, as follows: Bessemer steel, 1.76½c; angles, less than 3x3, 1.86½c, base; hoops in lots of 250 tons and greater, 2.06½c; less than this amount, 2.16½c; iron, 1.80c to 1.85c. Prices on lots from store are as follows: Steel, 2c to 2.10c; iron, 2.15c to 2.20c; hoops, 2.40c to 2.50c; angles, 2.25c rates.

Sheets.—There is a good demand for black sheets, but the inability of independent mills to get sheet bars renders deliveries very uncertain. A large tonnage is consequently turned every week to jobbers who have stocks on hand or contracts with mills. Galvanized material is active in sympathy with black sheets. We quote mill shipments, carload lots, Chicago delivery: Black sheets, No. 27, 2.86½c to 2.96½c; No. 28, 2.96½c to 3.01½c. Galvanized 75 and 5 percent. On lots from store, we quote No. 27 Black, 2.95c to 3c; No. 28, 3.05c to 3.10c. Galvanized 75 and 2½ percent.

Structural Steel.—The market has been quiet and sales have been limited to the usual run of small lots. Speci-

fications, however, are brisk, consumers in some cases exceeding same. We quote mill prices, Chicago delivery: Beams and channels, 16 inches and under, 1.75c to 2c; 18 inches and over, 1.85c to 2.10c; universal plates, 1.75c to 2.10c, according to delivery; angles, 3x3 and larger, 1.75c to 2c; tees, 3x3 and larger, 1.80c to 1.90c; zees, 1.75c to 1.95c. The maximum quotations are asked by some mills and dealers on lots for quick shipment. Store trade is quoted at 2¼c to 2½c per pound.

Plates.—There continues a good demand, and premiums are paid for lots for quick shipment. Owing to the capacity of mills being taken, considerable business is turned over to jobbers. We quote mill prices, Chicago delivery: Tank steel, ¼-inch and heavier, 1.90c to 2c; flange steel, 2c to 2.10c. The official price of 1.75c remains unchanged, though material cannot be bought at this figure in this market. Prices for lots from stock: Tank steel, ¼-inch and heavier, 2.15c to 2.25c; 3-16, 2.25c to 2.35c; No. 8, 2.30c to 2.40c; No. 10, 2.35c to 2.45c; flange steel, 2.40c to 2.50c.

Rails and Track Supplies.—The demand for rails for summer delivery is very heavy, as is evidenced by the report that a large Eastern producer has inquiries for standard sections from all its offices aggregating 500,000 tons, all for summer shipment. Only a small portion of this can be handled, and unless consumers are willing to take deliveries later in the year, the balance will have to be held over until next year or purchased abroad. Orders have been booked in Chicago during the past week for 5,000 to 7,000 tons. There is a brisk demand for light rails and track supplies. We quote standard sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carload lots, $32; light rails, 45 pounds, $34 to $35; 12 pounds, $39 to $40, with regular differentials for intermediate sizes. Track supplies mill shipments. Angle bars, 2c to 2.10c; spikes, first quality, 2.25c (out of store, carload lots, 2.35c to 2.45c rates); second quality, 2.10c; track bolts, 3½x¾, with square nuts, 2.85c to 3c per 100 pounds; with hexagon nuts, 3.05c to 3.15c, with usual differentials for other sizes.

Merchant Steel.—Implement manufacturers continue to place contracts for their requirements for the coming year, and a good tonnage has been closed in the past week. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c flat sizes; concave and convex, 2c; out of store, 2.15c; cutter shoe, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.30c to 2.40c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 to 10 percent higher; cold rolled shafting, carload lots, 47 percent off; less than carload lots, 42 percent off.

Merchant Pipe.—Inquiry is very heavy for the larger sizes of pipe and a big tonnage has been closed, though, as a result of the labor situation, demand for smaller pipe is very light. Several big deals for pipe for summer delivery are under way, notably one for 100 miles of line pipe and casing for Joplin, Mo., and for 34 miles of 6-inch pipe for Beaumont, Tex., all of which is to be laid this summer. The slight demand for small pipe has weakened prices, and several sellers believe a reduction will be made in the near future. We quote on carload lots, mill shipments, random lengths, f. o. b. Chicago, as follows:

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ⅜ in. inclusive	66.35	56.35	63.35	53.35
½ inch	68.85	58.35	65.35	55.35
7 to 12 inches, inclusive	67.35	57.35	64.35	54.35

Less than carload lots, 12½ percent advance over above prices.

Boiler Tubes.—A good demand exists, and the capacity of mills is taxed to meet the requirements of consumers. We quote below on carload lots, mill shipments, f. o. b. Chicago. On less than carload lots from mill, 12½ percent is to be added:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in.	43.35	38.35
1¾ to 2½ in.	55.85	35.85
2¾ to 5 in.	60.85	45.85
6 to 13 in.	55.85	35.85

For lots direct from warehouse stock:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in.	40	35
1¾ to 2½ in.	50	32½
2¾ to 5 in.	57½	42½
6 to 13 in.	50	32½

Cast Iron Pipe.—Demand is rather quiet, the only sale of importance being of 2,000 tons of 36-inch pipe for the city of Chicago. Minneapolis is in the market for 4,500 tons of 6-inch to 30-inch pipe, and Kansas City is also advertising for bids on a large lot. We quote f. o. b. Chicago, carload lots, 4-inch water pipe, $34; 6-inch, $33; 8-inch and upwards, $32; gas pipe $1 a ton higher. On large orders these prices can be shaded.

Billets and Wire Rods.—There is a heavy demand for billets for quick shipment, and a local importer has inquiries for German basic Bessemer billets aggregating 30,000 tons, more than half of which is from the West. The greater portion of this will undoubtedly be withdrawn, as deliveries cannot be made from German mills before August. Prices of the foreign product have advanced, owing to the heavy domestic demand in Germany. We quote German basic Bessemer billets, seaboard, $30 to $30.50; open hearth billets for use in rolling mills, $34 to $36; for forging purposes, $36 to $40, according to specifications; wire rods (the last sale) $40.

Wire and Wire Nails.—There is no lessening in the demand for nails and fencing, which exceeds the capacity of mills to supply. Jobbers throughout the west have depleted stocks, and the cry everywhere is for quicker shipments. Mills are from two to five weeks behind on all products. We quote prices to jobbers, Chicago delivery, as follows: Wire nails, carload lots, $2.20; less than carload lots, $2.30. Cut nails, steel, carload lots, $2.26½; less than carload lots, $2.36½. Plain wire, $2.10 carloads, and $2.20 in smaller lots; galvanized, carloads, $2.40; smaller lots, $2.50. Barbed wire, carloads, $2.50; less than carloads, $2.60; galvanized, carloads, $2.80; less than carloads, $2.90. Staples, carloads, $2.30; smaller lots, $2.40; galvanized, carloads, $2.60; smaller lots, $2.70. Bale ties, 85 percent discount f. o. b. Waukegan on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

Coke.—Ovens and railroads have co-operated to give this market an ample supply of fuel. Prices are easier, and Connellsville 72-hour coke is quoted at $5 at the ovens—$7.65 Chicago. Southern coke is offered at slightly lower prices.

Old Material.—There is very little demand for scrap iron and prices are weak. Mills are filled up with material, and dealers report a plentiful supply from the country. We quote gross tons as follows:

Old iron rails	$23 50 to 24 00
Old steel rails (mixed lengths)	17 50 to 18 00
Old steel rails (long lengths)	21 50 to 22 00
Relaying rails	31 50 to 32 00
Old wheels	23 00 to 23 50
Heavy melting steel	17 00 to 17 50
Mixed country steel	15 00 to 15 50

The following are selling prices per net ton:

No. 1 R. R. wrought	$19 50 to 20 00
No. 2 R. R. wrought	18 00 to 18 50
Shafting	19 00 to 19 50
Dealers' forge No. 1	16 50 to 17 00
No. 1 busheling and wrought pipe	14 00 to 14 50
No. 1 cast	17 00 to 17 50
Railway malleable	15 50 to 16 00
Country malleable	15 00 to 15 50
Iron axles	23 50 to 24 00
Steel axles	19 50 to 20 00
Cast borings	9 50 to 10 00
Mixed borings, etc.	9 50 to 10 00
Wrought turnings	13 50 to 14 00
Machine shop turnings	13 50 to 14 00
Iron axle turnings	14 00 to 14 50
Steel axle turnings	13 50 to 14 00
Stove plate and light cast scrap	13 00 to 13 50
Old iron splice bars	21 00 to 21 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, April 29.

The general condition at present in Cleveland and vicinity is one of extreme quiet bordering in some quarters on weakness. Ore is selling very slowly. The usual activity of the

opening of navigation is lacking. Sales of pig iron are reduced to a very low point. Buyers of finished material are hesitating. Prices of scrap are lower. There are, however, indications that the present dullness will not long continue and many observers believe that, although prices will be on a lower basis in some cases, the summer's business will be excellent. This hopeful feeling is found especially among dealers in finished material.

Iron Ore.—The Pittsburg Steamship Co. has made all the contracts for tonnage that it expects to make for the present, at the rates heretofore mentioned, and other shippers have also been chartering, so that about 20,000,000 tons, including tonnage of shippers' vessels, have been provided for. There is, however, no disposition to hasten shipments and there will not be until considerably more ore has been sold. Ore dealers are finding it very difficult to arouse interest among furnacemen, who are unable to see any reason for coming into the market now, when they have on hand supplies adequate for their requirements for from three to six months.

Pig Iron.—The buying of spot iron, which for several weeks was the only lively feature of the market, has not been so much in evidence this week, owing probably to larger shipments on old contracts, and sales are very limited, with prices easier. Disquieting rumors about sales of Southern iron in this district have been afloat, one being that 1,000 tons had been contracted for for the last half at $16 Birmingham for No. 2. While it is difficult to verify these rumors, it is known that iron has been sold at $16.50 for Southern at the furnace and at $20 for Northern at the furnace. It is now conceded, even by representatives of Southern Association furnaces, that the recent schedule of $17.50 for the West and $16.50 for the East can not be maintained. There are expectations of an early announcement of a new price for all buyers, which will be about $16. We quote as follows, f. o. b. Cleveland:

Bessemer	$21 00 to 21 50
No. 1 Strong Foundry	21 75 to 22 00
No. 2 Strong Foundry	21 00 to 21 50
No. 3 Foundry	20 25 to 20 75
Scotch No. 1	22 00 to 22 25
Scotch No. 2	21 25 to 21 75
Gray Forge, Valley	19 00 to 19 25
Lake Superior charcoal	24 00 to 25 00

Finished Material.—Conditions in the pig iron market affect those in finished material to the extent of causing buyers to hesitate and very little business is being done except for immediate requirements. This demand is shown especially in sales from store and jobbers are very well satisfied. Agricultural specifications are coming in freely on old contracts, which do not expire until July, but new contracts are not being made and inquiries indicate that buying will not be as heavy as it was last year. The base price for steel bars remains 1.60c for Bessemer and 1.70c for open-hearth, Pittsburg. Little is being done in bar iron at the quotation, 1.80c Youngstown, of the principal producers, who are not trying very hard to sell, and sales are being made by independent mills at 1.75c, Cleveland. There is very good demand for structural material, for which agreement quotations are as follows: Beams and channels, 3 to 15 inches, 1.70c; 18 to 24 inches, 1.80c; tees, 1.75c; zees, 1.70c; angles from 3 to 6 inches, 1.70c; universal plates, 1.70c. Although this is the season when there is usually a strong demand for sheets, orders are not coming in liberally and competition is about as lively as ever. The announced prices of the principal producer for sales through jobbers are as follows: Galvanized sheets, mill sales, carload lots, Nos. 10 and 11, 2.60c; Nos. 12-14, 2.70c; Nos. 18 to 21, 3c; Nos. 22 to 24, 3.20c; Nos. 25 and 26, 3.55c; No. 27, 3.80c; No. 28, 4.05c; No. 29, 4.45c; No. 30, 4.95c. Galvanized sheets out of stock are quoted 75 and 5 off. For 3-16-inch black sheets and heavier we quote 2.15c, Cleveland. Mill sales of black sheets to consumers are made on the following basis: No. 24, 2.65c to 2.75c; No. 26, 2.75c to 2.85c; No. 27, 2.85c to 2.95c. The following are prices out of stock. No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.50c to 2.60c; No. 16, 2.60c to 2.70c; Nos. 18-20, 2.75c to 2.85c; Nos. 22-24, 2.85c to 2.95c; Nos. 25-26, 2.95c to 3.05c; No. 27, 3.05c to 3.15c; No. 28, 3.15c to 1.25c.

Old Material.—The market is dull, with sales confined almost entirely to immediate deliveries, as buyers are looking for lower prices. We quote f. o. b. Cleveland, gross tons:

Old iron rails	$26 00 to 27 00
Old steel rail (over 6 feet)	22 00 to 23 00
Old steel rails (6 feet and under)	20 50 to 21 00
Old car wheels	24 50 to 25 00
No. 1 R. R. wrought scrap	22 00 to 22 50
Mill scrap	19 00 to 19 50
No. 1 machine cast scrap	19 50 to 20 00
Iron axles	29 00 to 30 00
Steel axles	28 00 to 29 00
Axle turnings	17 00 to 18 00
Wrought turnings (free from cast)	16 00 to 17 00
Cast borings	10 00 to 10 50
Uncut wrought iron boilers	11 00 to 12 00
Steel boiler plates	18 00 to 19 00
Grate bars	13 00 to 14 00
Pipes and flues (clean)	17 50 to 18 50
Tank iron	17 00 to 18 00
Hoop and band iron	13 50 to 14 50
Sheet iron	12 00 to 13 00
Wrought drillings	15 50 to 16 50
Malleable iron (railroad)	19 00 to 20 00
Malleable iron (agricultural)	16 50 to 17 00
Stove plate	15 00 to 16 00
Heavy steel	21 00 to 21 50

CINCINNATI.

April 28.

The coke market has taken a turn to lower prices for quick shipment and as low as $4 per ton f. o. b. ovens on foundry coke is heard, with $4.50 f. o. b. ovens for quick delivery as a current quotation. For forward deliveries the previous figure of $5 at the ovens is still maintained. The congestion of coke at the ovens is being worked off at low prices while railroad equipment is available and as railroads have placed an embargo on some places, localities that can take care of coke are finding it available at easier figures than in the recent past.

Pig Iron.—A dull and easy market has prevailed the past week. Lower quotations are freely in evidence throughout the territory. It seems as though the Eastern schedule of the association furnaces would represent the inside quotations in this territory. Even at the concessions there is not much resulting business. Buyers are making inquiries but in a number of instances the irregularity of the quotations from sellers induces them to defer placing orders. There has been considerable activity in the lower grade irons and a good aggregate tonnage of gray forge, mottled, and No. 4 foundry is reported but the prices at which the business was taken are not readily obtainable. It is fairly well established, however, that large orders were taken as low as $14.75 Birmingham for gray forge and mottled with No. 4 foundry at nearly the same price. These purchases are generally believed to have taken nearly all of the Southern low grades off of the market except those in the hands of the association furnaces. In foundry iron business has been light but on a few large orders $16.50 Birmingham for No. 2 foundry has been done. The bulk of the small quick shipment business has been at $16.75 to $17.25 Birmingham. The association furnaces appear to be maintaining the schedule in spite of the lower prices made by the independent interests. Sales of 4,500 tons of malleable Bessemer iron are reported with prices irregular, but around $19.50 Valley furnaces is the open price, while $19 is being talked of. The market is decidedly ragged and quotations are very irregular. The buyers are still inclined to hold off on their orders for future requirements. Sales agents are not offering opinions as to the future of the market and since the voluntary reduction in prices on April 1 by the association furnaces they have no good line of talk now for the buyers. Nevertheless there is a feeling of confidence that a better turn to the market is due in the near future. The iron on old contracts will be used up and as importations are practically out of the way, and consumption has not fallen off, but rather increased, the buyers will be in the market for their future needs. There is very little iron sold for delivery in the second half of the year as yet and when buyers commence to cover their requirements a strong situation will develop. This prospective demand and outlook encourages a feeling of confidence despite the present weakness which after all represents a weakness on a very small volume of business. We quote for any delivery f. o. b. Cincinnati:

Southern Foundry No. 1	$20 25 to 20 75
Southern Foundry No. 2	19 75 to 20 25
Southern Foundry No. 3	19 25 to 19 75
Southern Foundry No. 4	18 75 to 19 25
Southern Foundry No. 1, soft	20 25 to 20 75
Southern Foundry No. 2, soft	19 75 to 20 25
Gray forge	18 00 to 18 50
Northern Foundry No. 1	22 65 to 23 15
Northern Foundry No. 2	22 15 to 22 65
Southern car wheel iron	27 75 to 28 75

Finished Material.—The market is steady but somewhat less active than in the recent past. There is no quotable change in prices but desirable orders are competed for at slight concessions. Some independent mills are talking higher prices for sheets but the leading interest has made no change in quotations. Galvanized sheets are being quoted at 75 and 5 percent off. We quote black sheets No. 27 at 2.78c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.10c; No. 27, 3.20c; No. 16, 2.65c; No. 14, 2.55c; No. 12, 2.45c; No. 10, 2.35c. Tank plates are firm and sell out of store at 2.15c for ¼-inch and 2.25c for 3-16-inch. Beams and channels are quoted at 2.15c to 2.25c from stock, and angles at 2.15c to 2.25c for base sizes. In merchant pipe, trade is running along in a normal and usual channel. Business is not so active as some 60 days ago but there is a fair trade all the time and a steady market. We quote:

MERCHANT PIPE.
(Basing Discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛, ¼, ⅜ inch	66.7	56.7	63.7	53.7
½ inch	68.7	58.7	65.7	55.7
¾ to 6 inch, inclusive	73.7	63.7	70.7	60.7
7 to 12 inch, inclusive	67.7	57.7	64.7	54.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ inch	41.2	35.2
1¾ to 2½ inch	54.2	34.2
2¾ to 5 inch	59.7	44.2
6 to 13 inch	54.2	34.2

Old Material.—The market holds steady and unchanged with a fair demand. Dealers pay the following prices:

Old No. 1 railroad wrought, net tons	$19 00 to 19 50
Cast machine and foundry, net tons	17 00 to 17 50
Old iron rails, gross tons	22 50 to 23 00
Old steel rails, gross tons	21 50 to 22 00
Old short lengths, gross tons	17 50 to 18 00
Old iron axles, net tons	27 00 to 27 50
Old chilled car wheels, gross tons	22 00 to 22 50
Stove plate, net tons	11 50 to 12 00
Wrought turnings, net tons	15 50 to 15 75
Cast borings, net tons	12 00 to 12 50

NEW YORK.

OFFICE OF *The Iron Trade Review.*
ROOM NO. 1909, 150 NASSAU ST. April 29.

Pig Iron.—Buyers of foundry iron seem to have things their own way, and are being eagerly sought by sellers, who find them still determined to buy only as their immediate wants necessitate. In forward delivery, especially for the second half, the market does not show the slightest animation. Nothing seems to be able to shake the opinion of consumers that prices are on a downward trend. In foreign irons the dullness is even more pronounced, one of the largest importers here stating that he has not disposed of a pound of foundry iron in three weeks. Prices are lower, Middlesboro No. 3 being obtainable in cargo lots, ex-ship, duty paid, at $17.75, but no buying is reported. German irons also show a sagging tendency, and while no sales have been made, cargo lots can doubtless be had at from $19.50 to $20. There is some talk of American buyers trying to cancel old contracts for German irons, but we have been unable to verify it. There is no doubt, however, that considerable quantities of them have been bought, one commission house being credited with the purchase of 25,000 tons, with the majority of it still undelivered. New York prices for immediate delivery are as follows: No. 1 X Northern, $21.50 to $21.75; No. 2 X Northern, $20.25 to $20.75; No. 2 plain Northern, $19.75 to $20.25; No. 1 Southern foundry, $21.50 to $21.75; No. 2 Southern foundry, $20.50 to $20.75; No. 3 Southern foundry, $19.50 to $19.75; No. 4 Southern foundry, $19 to $19.25.

Billets.—Inquiries for German billets have greatly increased in number, but importers say that the majority of mills are sold up until midsummer and some until September. Negotiations are now on for the purchase of 6,000 tons of Bessemer basic billets for summer delivery and the sale will probably be closed in a few days. The price will be between $29.25 and $29.50. In open-hearth billets the activity is not as keen, but prices are strong, at from $30 to $30.50.

Finished Iron and Steel.—Official announcement was made on last Friday of the settlement of the American Bridge Co. strike, which, together with reliable assurances that few if any labor disturbances will ensue on May 1, has been instrumental in injecting more activity into the structural material market. The American Bridge Co. reports an excellent business, the most notable being 2,500 tons for the Maine Central Railroad; 2,500 tons for the Wabash road; 2,300 tons for the Chicago & Northwestern road to be delivered as desired; and 1,900 tons for the Oliver building, Pittsburg. The sheet market is strong, and the buying has a snap to it that is surprising. In regular sizes deliveries are fair, but in odd sizes the mills are behind in executing orders. Store stocks command premiums. Plates still occupy a strong position, while bars are fairly active, with sales from stock not as satisfactory as they have been. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 2.10c to 2.15c; flange, 2.25c to 2.30c; fire box, 2.30c to 2.50c; refined iron bars, 1.95c to 2.10c; soft steel bars, 1.80c to 2c; steel sheets, in carloads, New York, No. 28 black, 3.05c to 3.15c; galvanized, 72½ to 75 and 2½ off.

PHILADELPHIA.

April 28.

There is little demand for pig iron except for immediate needs and the outlook is uncertain. A great deal of interest is felt in the present rather unusual conditions, but there are few who are willing to predict what will be the next turn of the market. It is believed that the prices of finished material are low as compared with those of pig iron and that if there are any further declines, they will be in the latter rather than in the former.

Pig Iron.—Sales are in small quantities and not numerous. There is little demand for foundry except spot, but basic, low phosphorus and forge prevent the market from being entirely stagnant. Foreign iron for foundry use is lower, being about $18 for cargo lots of No. 3 Middlesboro. German iron is also lower and Pennsylvania furnaces are said to be quoting special prices to meet foreign competition. We quote as follows: No. 1 X Foundry, $22.50 to $23; No. 2 X Foundry, $21.25 to $21.50; No. 2 plain, $20.50 to $21; gray forge, $19 to $20; Middlesboro No. 3, $20.50 to $21; Scotch, $21.50 to $22.50; basic, $19.75 to $20.25.

Billets.—Steel is scarce and in strong demand. Large lots of foreign are sold at $29. The price of American ranges from $32 to $34.

Finished Material.—Business is not as good as it was last year and mills have no trouble in meeting demands. Productive capacity is much greater and customers have no fear of not being able to get reasonably prompt deliveries. While there is no rush of orders, sales have been made steadily and prices are not weakening. We quote: Plates, in small lots, 2c to 2.05c; carload lots, ¼ inch and thicker, 1.85c to 1.90c; universals, 1.90c; flange, 2.10c; marine, 2.15c to 2.20c; fire box, 2.25c to 2.30c. Best refined iron bars, 1.93½c for carload lots as a minimum quantity and 1.75c to 1.85c for steel bars. For beams, angles or channels, ordinary sizes, 1.73½c to 1.78½c is quoted on carload lots, with additions for smaller quantities.

Old Material.—There is a falling off in demand for borings, stove plate and No. 1 wrought, and prices are somewhat lower. We quote: Old steel rails, $21.50 to $22; miscellaneous heavy steel scrap, $20.75 to $21.50; low phosphorus scrap, $28 to $29; old steel axles, $27 to $28; old iron axles,

$30 to $31; old iron rails, $24.50 to $25.50; old car wheels, $23.50 to $24.50; choice scrap R. R. No. 1 wrought, $23 to $24; country scrap, $20 to $21; machinery cast, $19 to $20; No. 2 light scrap (forge), $18.50 to $19; No. 2 light scrap (ordinary), $14 to $15; wrought turnings, $16.50 to $17; wrought turnings, choice heavy, $18 to $18.50; cast borings, $11.50 to $11.75; stove plate, $16 to $16.50.

BIRMINGHAM, ALA.

April 28.

The past week witnessed but little or no change in the condition of the iron market. Some independent furnaces are reported as cutting prices, but doing very little business. Since the reduction of prices April 1 it is understood that association furnaces have sold 15,000 to 20,000 tons, principally for prompt delivery, and the greater portion of this is reported to have been gray forge, mottled and 4 foundry. Very few sales have been made for delivery the last half of the year. The transportation facilities are better now than they have been for a long while, enabling furnaces to keep pretty well up with their contracts. All furnaces report good supply of raw material. The Philadelphia furnace of the Sloss-Sheffield Steel & Iron Co. at Florence, Ala., was blown in the past week, after having been relined and overhauled. The Woodward furnace No. 1 was also blown in. Furnace coke can now be had at $5.00 to $5.25 at the ovens. Foundry coke commands 25 to 50 per ton better price. The output of coal for the month of April will probably exceed that of any previous month in the history of the district.

The Southern Car & Foundry Co. has moved part of its general office force to Anniston, so as to be nearer the scene of active operations. The assistant to the president, who is filling the duties of general manager, together with the treasurer, will continue the headquarters in Birmingham for the present.

The Seaboard Air Line Railway announces that by January 1, 1904, its trains will be running into Birmingham over its own tracks. The Illinois Central is making headway on its line approaching Birmingham, and there is but little doubt that within twelve months that road will have an entrance to Birmingham. A large tract of land has been optioned near North Birmingham, presumably for yard and shop room for that company.

The Gadsden district continues to attract a deal of interest from investors. It is now announced that the Southern Railway (or rather the Alabama Great Southern, controlled by the Southern), will tap the Greasy Cove district, through which the Louisville & Nashville is extending its Birmingham Mineral branch, connecting with its Alabama Mineral branch at Attalla, five miles west of Gadsden. It is understood that the reports of several experts show very valuable ore and coal lands in the Greasy Cove field, justifying fully the large expenditures necessary for the railroads to tap that territory.

The Eumawhee Mining Co. is installing heavy machinery, such as boilers, engines, crusher, etc., at its property recently acquired near Sylacauga, Ala., and within the next 60 days will be supplying ore from its deposits there. This is a stratified deposit of gray ore, slightly magnetic, the vein showing a thickness of about seven feet, with an average analysis of 48 percent to 50 percent metallic iron. Unlike the red ores of this district, this deposit carries no lime and no alumina, which it is said will make it a very valuable ore for mixing with the ores now in use throughout the district.

ST. LOUIS.

April 28.

Pig Iron.—The past two weeks have been the quietest in many months. More iron is sold at shaded figures than at the association price. In several instances No. 2 foundry has been sold at $16.50 Birmingham in lots of from 100 to 200 tons. The reign of fancy priced coke is over. Users are feeling no apprehension either as to supply or price. The best grades of Connellsville can be had at East St. Louis for $7.80, with a disposition to go even lower. New River grades are $1 less. We quote Southern No. 1 at $21.25 to $21.75; No. 2 at $20.75 to $21.25; No. 3, $20.25 to $20.75; No. 4, $19.75 to $20.25; gray forge, $19.25 to $19.75.

Finished Material.—Jobbers and agents report that the business for the last two weeks has not been as satisfactory as in preceding weeks. Southern collections are not what they should be and in spite of the fact that transportation could not be quicker, buyers are holding off on important purchases. This is not taken to argue any weakness in the market for prices in all lines are well sustained. Iron and steel bars are quoted at same combination price of 1.82c, while jobbers are getting 2.25c for the same. There has been quite a little demand from south and southwest for rail and track supplies. Spikes are 2.30c, and splice bars 2.05c to 2.15c. There have been no large sales of structural material, but prospects in this line are improving. The leading interest reports a satisfactory tonnage in boiler tubes. Deliveries leave no room for complaint. For merchant pipe we quote f. o. b. Saint Louis out of store as follows: Black, ⅛ to ⅜-inch, 66 off; ½-inch, 68 off; 7 to 12 inches, 68 off; galvanized, ½ to ⅜-inch, 56 off; extra long, 60 off; double extra long, 50 off.

Old Material.—There has been heavy buying in those lines in which the large dealers are compelled to fulfill contracts. The yards of the middleman and small dealer are kept well cleaned. Pig iron prices do not seem to have affected the scrap market materially. Dealers' quotations range as follows for gross tons: Iron rails, $28.80 to $26.00; heavy melting steel scrap, $20.50 to $21.50; mixed steel, $18.50 to $19.25; heavy relaying rails, $31.00 to $33.00; No. 1 railroad wrought, $21.00 to $21.75; shafting, $21.00 to $22.00; iron axle turnings, $16.50 to $17.00; cast borings, $11.00 to $11.50; No. 1 boilers, cut, $14.00 to $15.00; heavy cast scrap, $18.50 to $19.50; stove plate, $13.00 to $14.00; railroad malleable, $16.00 to $17.25; iron axle turnings, $15.00 to $16.00; Busheling scrap, $16.25 to $17.50.

Metals.—Trading has been the lightest in several months. Jobbers are quoting as follows: Copper, 15¼c; tin 32¼c; antimony, 8¾c; zinc, 6c; lead, 4¾c; spelter, 5.40c. Lead is scarce at 4.50c for soft Missouri and 4.57½c for desilverized.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
Room 1909, No. 150 NASSAU ST., April 28.

Pig Tin.—Since our last report, the market has advanced a little, although the buying has been extremely limited. Some jobbers have been known to shade quotations for the purpose of attracting buyers, but the latter don't seem to respond. Several conditions have not changed beyond those previously enumerated. In London the market has shown some slight strength, and prices are a little higher. Today's closings at the Metal Exchange are as follows: Spot to May, 29.95c to 30⅛c. London closed today with £137 7s 6d for spot, and £137 for futures. Arrivals at Atlantic seaports for the month to date aggregate 3,030 tons, with 3,664 tons afloat.

Copper.—Dullness has characterized the market during the week. Heavy offerings continue in the open market, but buyers show no disposition to take them. Prices are nominal. Trade advices declare the demand to be very slow. In London the market has been very weak, spot reaching the lowest point in weeks yesterday, when it sold for £59 7s 6d, but today it was slightly higher. Today's closings at the Metal Exchange were as follows: Lake and electrolytic, 14¾c to 15c; casting, 14½c to 14¾c. In London today both spot and futures closed at £60. Exports for the month to date aggregate 9,099 tons, against 14,277 for a similar period last year.

Lead.—On last Saturday the American Smelting & Refining Co. reduced the price 30 points, making the official price 4.37½c for lots of 50 tons or more. Accumulation of supplies here and abroad was the cause. St. Louis and London are lower in proportion, being 4.25c and £11 17s 6d, respectively. Options on the leading plants that were to form the $65,000,000 lead combination formed some time

ago, expired on March 31, without any absorptions taking place, owing to the inability to have the scheme financed. This kills it.

Spelter.—Is firm at 5.75c for spot. St. Louis is slightly higher at 5.50c. London declined to £21 7s 6d.

Antimony.—Cookson's is weaker at 7¾c to 8c. Hallett's is unchanged at 7c. Other brands are 6¾c.

Quicksilver.—Slightly higher at $47.50 per flask of 76½ pounds in lots of 100 flasks. London unchanged at £8 12s 6d.

Nickel.—In good request at 40c to 47c for large lots down to a ton, and 50c to 60c for smaller quantities.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK, April 28.

Demand for metals has been brisk during the week under review and prices have strengthened. We quote lake copper, carload lots, 14¾c; smaller quantities, 15c. Pig lead, 4.60c in 50-ton lots, and 4.65c in carload lots; pig tin, 31c; spelter, 5½c, in carload lots, and 5¾c to 6c in less quantities; sheet zinc, 6½c to 6¾c for lots over 600 pounds. Antimony, 10¾c to 11c for Cookson's, and 9¾c for Hallett's. We quote old metals as follows: Copper wire, 12c; heavy copper, 11¾c; light copper, 11¼c; heavy red brass, 11¾c to 12c; heavy yellow brass, 8½c to 9c; light brass, 7c.

A. F. A. Meeting at Milwaukee.

Committees have been appointed by Milwaukee foundrymen for the convention of the American Foundrymen's Association on June 9, 10 and 11, 1903:

Executive Committee.—S. W. Watkins, chairman; C. E. Sammond, E. N. Dickson, Irving Reynolds, A. W. Bair.

Reception Committee.—A. W. Bair, chairman; T. J. Neacy, Irving Reynolds, W. J. Turner, W. J. Adams, Harry Bayley, F. W. Sivyer, F. M. Prescott, H. F. Crandall, Otto Falk, B. Kaveledge, V. Nortman, Prof. Johnson, A. J. Lindemann, O. W. Greenslade, C. A. Sercomb.

Committee on Halls, Hotels and Carriages.—E. N. Dickson, S. Knox, C. A. Maynard, R. J. Schwab, W. J. Turner, T. W. Sheriffs.

Entertainment Committee.—C. E. Sammond, H. B. Goodrich, G. H. Smith, J. O. Bradley, W. L. Douglas, F. W. Sivyer.

Finance Committee.—S. W. Watkins, E. N. Dickson, W. J. Read, A. J. Lindemann, O. W. Greenslade, Theo. Vilter, W. H. Osborne.

Press Committee.—Irving Reynolds, B. Hoffmann, R. J. Watrous, of Citizens' Business League; R. S. McPherrin, H. W. Bolens, A. I. Findley, *The Iron Trade Review*; C. Kirchhoff, *Iron Age;* John A. Penton, National Founders' Association; Henry Hansen, *The Foundry*; J. H. Pepper, *Brass Founder and Finisher*; H. E. Field, Dr. Richard Moldenke.

Mohawk Valley Steel & Wire Co.

Despatches from Brunswick, Ga., in the past week have told of the breaking of ground for the "$10,000,000 steel plant which the capitalists of the Brunswick & Birmingham Railroad Co. and the Mohawk Valley Steel & Wire Co. will build at this place." The said capitalists are announced to have arrived in a special car from New York and to have gone to the site of the proposed steel and shipbuilding plant for the purpose of turning the first shovelful of earth. F. A. Umstead, whose experience with the Hartman Mfg. Co.'s wire plant at Ellwood, Pa., and later at New Castle, Pa., will be remembered, is president of the Mohawk Valley Co. Recently a press telegram announced that the company had increased its capital from $15,000,000 to $60,000,000, though the former sum properly applied would seem ample to make a good beginning on a steel plant.

The Ball Engine Co., of Erie, Pa., has secured an order for four vertical cross compound engines, each direct connected to 150-k. w. Crocker-Wheeler generator, for the new First National Bank Building, of Chicago.

PERSONAL.

Andrew Carnegie sailed for Europe last week. He will preside at the meeting of the Iron and Steel Institute in London in the first week of May.

W. L. E. Mahon, engineer, formerly with the Brown Hoisting Machinery Co., Cleveland, has accepted the position of superintendent of the Portsmouth Foundry & Machine Works, Portsmouth, O.

O. B. Warren, who was superintendent of the Penobscot mine at Hibbing during the ownership of that property by the Union Steel Co., is now superintendent of the Higgins mine of the U. S. Steel Corporation, two miles north of Virginia, a new steam shovel proposition.

John A. Caldwell has severed his connection with the American Stoker Co. and is now general sales manager of the Wilkinson Mfg. Co., of Bridgeport, Pa., with office at No. 45 Broadway, New York.

Prof. Chas. R. Van Hise, whose geological work on the Lake Superior iron ore ranges is well known, has been elected president of the University of Wisconsin to succeed the late Chas. Kendall Adams.

President W. B. Schiller, of the National Tube Co., and a party of officers of that company, left Pittsburg last week in a private car on a tour of inspection of the Eastern plants of the company.

J. H. Allman, formerly district manager of the Southern Car & Foundry Co., with headquarters at Anniston, Ala., has resumed his duties as assistant manager of works with the Pressed Steel Car Co., of Pittsburg.

Robert Menk, superintendent of the electrical department of the Sharon plant of the United States Steel Corporation at Sharon, Pa., has been placed in charge of the same department of the Union Steel Co. at Donora, Pa. Frank McKee, of Cortland, N. Y., will be placed in charge of the Sharon plant.

President C. M. Schwab, of the United States Steel Corporation, accompanied by Mrs. Schwab, is spending the present week at his country home at Loretto, Pa.

W. R. Beatty, formerly superintendent of the hardware department of the Oliver Iron & Steel Co., Pittsburg, has been appointed superintendent of the plant of the New Castle Forge & Bolt Co.

John C. Searight, formerly assistant superintendent of the furnaces of the National Steel Co., at New Castle, Pa., has been advanced to the position of superintendent. George Brenner has been made assistant superintendent.

Thos. F. Griffin, of Corrigan, McKinney & Co., Cleveland, after spending several months at Las Cruces, N. M., has started on a trip to California. His health has been restored and he expects to return home about June 1.

Another Track from Youngstown to Pittsburg.

(Special Telegram.)

PITTSBURG, PA., April 29.—Directors of the Pittsburg & Lake Erie Railroad recommend increasing the capital from $8,000,000 to $10,000,000, subject to a special stockholders' meeting on June 29. This follows similar increases last August and February. The principal object is the laying of 70 miles of new track, making four tracks from Pittsburg to Youngstown. The delivery of cars of 100,000 pounds capacity by the Standard Steel Car Co. is expected to begin May 1 and to be completed in six weeks.

The first steel transfer barge made by the American Bridge Co., at Ambridge, was put in service last week at New Orleans by the Southern Pacific road. It is 300 feet long with four tracks, accommodating 24 cars.

The pattern building of the Mansfield Engineering Co., Mansfield, O., was destroyed by fire April 28. Loss, $8,000; insurance, $2,500. The company will rebuild.

The Brown Corliss Engine Co., Corliss, Wis., has received an order from the Pfister & Vogel Leather Co., of Milwaukee, for a 28x48-inch heavy duty Corliss engine; also an order from F. R. Payne, of Williams, Ia., for a 12x30-inch Corliss engine.

TRADE PUBLICATIONS.

The W. P. Davis Machine Co., of Rochester, N. Y., has a new catalogue, standard size, which covers a complete line of lathes from 10-inch up to 48-inch swing; all sizes of cutting-off machines up to and including 6 inches capacity; two sizes of keyseaters, and upright drills from 12 inches to 32 inches swing. The firm is adding new sizes constantly and the above line is made from new patterns. The catalogue contains a cipher code arranged for general use and for each machine. An interesting feature is a map on which is shown the permissible freight deliveries from Rochester to the more important cities of the country.

A list of the users of the cranes and hoists manufactured by the firm of Pawling & Harnischfeger, of Milwaukee, has been published. It is brought up to April of this year and numbers nearly a thousand machines; the customers are quoted alphabetically for ready reference, the types of machines are classified and the exact service and capacity of every machine is presented. A large percentage of representative concerns are noted among the American customers and there is also a very creditable showing among foreign patrons.

Pamphlet No. 031 is another installment in the series showing some applications of industrial railways made by the C. W. Hunt Co., of West New Brighton, Staten Island, N. Y. The present application relates to boiler rooms and these represent practice in varied service, one of the illustrations showing the boiler room of the Government Tramways Power Station at Sydney, New South Wales.

The price list of the bolts, nuts, rivets, wrenches, etc., made by the Lamson & Sessions Co., of Cleveland, is a well bound 4¾x7-inch pamphlet containing about sixty pages. The pages have a marginal index and the tables are concisely arranged.

A descriptive circular of the characteristics and uses of "Lumen," a bearing bronze invented by Prof. R. C. Carpenter, of Cornell University, and made by the Lumen Bearing Co., of Buffalo, is sent out with a neat pictorial calendar. Incidentally it may be pointed out that Lumen is not a babbitt but is melted, cast and tooled in a similar manner to ordinary bronze.

The catalogue of milling machines manufactured by the R. K. LeBlond Machine Tool Co., of Cincinnati, is an excellently printed pamphlet containing some 75 6x9 pages, with numerous illustrations. The cuts are very fine. In addition to a number of halftones, there are reproductions from drawings to show the general symmetry of the millers as well as the detailed construction, the firm being of the belief that reproductions from representative drawings give a much better idea of the elegant proportion of detail than a cut. The many halftones certainly intensify such an impression. The catalogue is an interesting commentary upon modern milling machine manufacture.

The English government has expressed a willingness to contribute $15,000 towards the work of the British Engineering Standards committee and will also nominate a representative to co-operate with the other members. The subscription is offered with the intimation that the amount is subscribed for the present year only but the committee is in hopes that further assistance will be given, the better to maintain a permanent body for the revision of the standards and to modify the methods of testing as necessity may arise. The amount seems small enough, particularly in view of the fact that a member of the government has announced that the adoption of standard fittings by three firms in the manufacture of 12-inch guns for the navy had effected a saving of $1,000,000.

Among sales of engines in the iron and allied trades in March the Allis-Chalmers notes the following: Carnegie Steel Co., Pittsburg, one 42 and 66x60 tandem rolling mill engine; Oliver Iron Mining Co., Duluth, Minn., one 16x36 1890 frame Reynolds Corliss engine; Woodward Iron Co., Woodward, Ala., three 44 and 84x60 vertical long crosshead blowing engines; Illinois Steel Co., Chicago, two 46 and 86x84, and 84x60 vertical steeple cross compound blowing engines; Scranton Bolt & Nut Co., Scranton, Pa., one 18x36 1890 frame Reynolds Corliss engine; Griffin Wheel Co., Chicago, one 18x48 1890 frame Reynolds Corliss engine, with compressor attachment; Pennsylvania Railroad Co., one cross compound Riedler air compressor, 15 and 24x36.

American Can Co.

The annual report of the American Can Co. just issued shows the following: Plants, real estate, patents, etc., valued at $75,298,083, an increase of $41,704. Improvements, $1,808,339; increase, $1,441,470. Cash, $1,639,291; increase, $563,502. Bills and accounts receivable, $1,488,214; increase, $1,190. Machinery and inventories at cost, $5,121,901; decrease, $719,984. Other assets, $1,009,439; no change. Total assets, $86,365,263; increase, $1,327,883. The profits of the year were $886,711, increasing the surplus to $2,662,275. Judge Moore states that it is expected to commence dividends on the preferred stock in six months. None has been paid since the company organized.

The engineers and draughtsmen employed by the American Bridge Co. in the Pittsburg district have organized a club and will erect a club house at Ambridge, Pa., at a cost of $7,500. The club has been incorporated under the laws of the state of West Virginia with a capital of $9,000. The incorporators are: Richard Paxson, S. R. Jenkins, R. L. Pellett, J. K. Thompson, H. S. Breitenstein and J. B. Breitenstein.

Joseph Sellwood, the well-known mining man, of Duluth, has returned from the Pacific coast where he investigated the iron district of lower California. He says there are some small deposits of hard ore of fairly good quality, but he was disappointed with the results of his investigation, as were those whom he represented. He covered 500 miles of territory with teams, and made a very exhaustive study of the district.

One of the largest mortgage indentures ever drawn was formally executed on April 21. Charles M. Schwab, president of the United States Steel Corporation, signed this indenture, which covers the proposed issue of $250,000,000 5 percent bonds of the United States Steel Corporation. This indenture will be held by the United States Trust Company as trustee of the stocks covered by it. It was formally accepted by Lyman G. Gage, president of the United States Trust Co. In order to secure the payment of the principal and interest of the bonds the steel corporation has transferred in trust to the United States Trust Co., among other properties, these shares of different stocks: $62,905,000 capital stock of the Carnegie Steel Co.; $53,260,900 preferred stock of the Federal Steel Co., the entire outstanding issue; $46,483,800 common stock of the Federal Steel Co.; $39,907,400 preferred stock and $39,936,300 common stock of the National Tube Co.; $39,998,500 preferred stock and $49,899,800 common stock of the American Steel & Wire Co.; $31,363,900 preferred and $30,949,700 common stock of the American Bridge Co.; also all the right, title and interest of the steel corporation in and to $159,777,000 par value of the collateral trust 5 percent bonds of the Carnegie Co. issued under the deed of trust dated April 2, 1900. The indenture contains the clause providing for non-forfeiture until default in payment of interest shall have continued for the period of two years.

A large force of surveyors is at work at McKeesport, Pa., and it is stated that actual construction on the new tube plant will begin within 60 days.

The executive committee of the Blast Furnace Workers' Union will meet in a few days to formulate demands for an advance in wages.

Application was made on Tuesday at Pittsburg for a building permit for a 12-story department store building at Wood St. and Sixth Ave. for Henry W. Oliver, to cost $600,000. It will be completed in one year. The size is 96x215 feet.

The directors of the reorganized Manufacturers' Light & Heat Co. have authorized the building of a new pipe line from West Virginia to Pittsburg, employing 20-inch pipe.

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ROBERT I. CLEGG, - - EDITOR MACHINERY DEPARTMENT.
GEORGE SMART, - - - - ASSOCIATE EDITOR.

CHICAGO: 519 Monadnock Block, GEO. H. GRIFFITHS, Manager.
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BERTRAND-THIEL PROCESS AT CLAIRTON, PA.

The Clairton Steel Co. some time ago acquired the American rights for the Bertrand-Thiel process, and will put it in operation on all its basic furnaces as soon as mixer metal is available through the starting of the two remaining blast furnaces. No. 1 was blown in Tuesday, April 21, at 2:30 p. m., and at 3 p. m. the following day the first cast was made. The second furnace will be blown in within a fortnight, and the third furnace will follow two or three weeks later. The Clairton steel plant consists of 12 50-ton furnaces, of which as many as are required are used with an acid lining. The number rose to as high as four at one time, while lately but one furnace has been used with the acid process. Only ten all told have been in operation, the remaining two being held until the blooming capacity is sufficient. The blooming mill has been rapidly reaching requirements, having made as high as 944 tons in 24 hours. Later a billet mill will be in operation which will relieve the blooming mill.

A very large mixer has been installed, with ample heating arrangements. It is intended to charge a portion of the total of 20 percent scrap used under the Bertrand-Thiel process, direct into the mixer, which will not only melt the scrap but raise the temperature of the entire charge. The steel furnaces are of the ordinary type, the only difference in the plant, in using the Bertrand-Thiel process, being that the ladles have unusual efficiency. Half the steel furnaces will be run as primary and the remainder as secondary, the partly refined steel being drawn from each primary furnace in the regular ladle, and transferred to a secondary furnace, in which the remainder of the scrap, not used in the mixer, will have been previously charged and melted. Practically standard Bessemer iron will be used in the steel plant, from the new furnaces, but this is no departure, as the plant has been using practically Bessemer iron for some time, most of which came from the Shenango furnaces.

An innovation was introduced at the blowing in of Clairton Furnace No. 1, in that it was blown in with Mesabi ore exclusively. The first cast, made 24½ hours after the fire was lighted, was .076 percent sulphur, while the second cast was .046 percent, so that the furnace got down to standard iron on the second cast, which would be a good record had it been blown in with the usual percentages of old range ore and cinder. It is the intention to run the Clairton furnaces entirely on Mesabi ore, but this is no new practice, as at the Shenango furnaces the record for three years has been an average of not less than 90 percent Mesabi, and for the past year the charge much of the time has been Mesabi only, while at times some cinder has been used. The governing factor the past year has been solely the analysis of the ore. When the ore has come down so low in silica as to require silicious additions to make a fluid slag, the additions have been made.

All the ore properties of the Clairton Steel Co. are on the Mesabi range, except the Champion mine, purchased last December, but the Champion ore is to be used chiefly in the open-hearth steel furnaces. The ores in general are above the average Mesabi in structure. The Clairton furnaces were built with the especial intention of using all Mesabi ore, the bosh diameter being large in proportion to the height. At older furnaces, not so built, from 60 to 80 percent Mesabi has been common practice, and a number of furnaces are using 80 percent and slightly higher without serious trouble.

It is expected that the new blast furnace of the Toledo Furnace Co., Toledo, will be blown in May 9.

The average annual net profits of the Brown-Ketcham Iron Works, Indianapolis, for the past four years are given at $129,181.

The first consignment of steel rails for the road which Alfred B. Iles and associates have undertaken to construct from Valdez, Alaska, to the interior of the Copper river valley, with the intention ultimately of extending it on through the new Tanana district to a point on the American Yukon, was shipped north on the Pacific Packing & Navigation Co.'s steamer Excelsior, sailing from Seattle April 25.

The United States Cast Iron Pipe & Foundry Co. has declared the usual quarterly dividend of 1 percent on the preferred stock, payable June 1.

A receiver has been appointed for the Cosmopolitan Power Co., William F. Anderson being named. The company is a New Jersey corporation, with a capital of $2,500,000. It has a plant in Chicago. The assignment is in favor of Manning, Maxwell & Moore, of New York, and of Chicago creditors.

Representatives of the railroads which haul ore from the docks to Pittsburg and intermediate places from lake ports have decided to make no change in last year's schedule, which was on a basis of $1.18 per ton from docks to Pittsburg. Some of the railroads were said to be in favor of raising the rate to $1.25. Dock managers have fixed the price for unloading ore from vessels at 21 cents per ton.

The Baltimore & Ohio Railroad will, it is reported, order from 100 to 150 new locomotives for delivery during 1904. These additions will represent an outlay of about $2,000,000. This company has in the past two years spent nearly $5,000,000 for motive power, including engines now under construction. Deliveries are now being made of locomotives ordered last year and promised sixty days ago. The deliveries now being made are of a lot of 200. It will be Fall before all shall be received.

At a meeting of the directors of the Kansas Bolt & Nut Co., Kansas City, Mo., held a few days ago to take action in regard to the vacancy caused by the death of P. H. Sternbergh, vice president and treasurer of the company, the following officers were elected: J. H. Sternbergh, of Reading, Pa., vice president; H. R. Warren, of Kansas City, secretary and treasurer; Solomon Stoddard, of Kansas City, manager.

The annual meeting of the American Car & Foundry Co. will be held in the last week in June. The fiscal year of the company ends the last day of April. The business of the company has been so large that it is estimated, from advance figures, that net earnings of the company for the fiscal year will be at least double the entire dividends on both the common and preferred stock.

The Beloit Iron Works, Beloit, Wis., has purchased a 70-h. p. engine arranged for direct connection to a Northern generator from the Ball Engine Co., Erie, Pa.

Current Wage Questions.

Structural Workers' Strike Settlement.

The settlement of the strike of the structural workers as announced in these columns last week from Pittsburg, covers the entire states of Pennsylvania, Ohio and West Virginia and a settlement of the Eastern scale, including New York and Boston, has since been made. Conferences will be held this week for the settlement of the scale matters in Chicago, Milwaukee, Denver and St. Louis, although in the latter place the present scale does not expire until June 1. There is little doubt that the wage demands will be amicably settled throughout the country by May 1, as the settlement made in New York and Pittsburg is satisfactory to the men in the western part of the country. The demands for increases in wages were granted in New York and at the Pittsburg conference, but the clause pertaining to the declaration of sympathetic strikes was stricken out entirely. The new scale agreement becomes operative on May 1, and continues in force for twenty months, or until Jan. 1, 1905. This was the contention of the manufacturers, and means no further scale settlements for nearly two years, although the workers insisted that their demands should be considered every year.

Proposed Amalgamated Scale.

The deliberations of the Amalgamated Association convention at Columbus will be concluded this week. About all the scale demands have been formulated, and outside of the iron scale no demand of any importance will be made on the manufacturers. In the sheet and tin plate scales the workers will ask for a number of minor changes, covering mill conditions, and to offset the expected demand of the manufacturers for an abolition of the limit of output, will ask for some further restrictions on the present system.

In the iron scale an effort will be made to move up the base price, and to increase the differential in the higher range of the scale from 12½ to 25 cents for each tenth cent difference in the ascertained price of common iron bars. This change will be resisted by the manufacturers, who have had to pay such high prices for scrap the past year that they are inclined to question the justice of allowing wages to advance rapidly with the selling price of iron, when the advance is forced mainly by the high price which has to be paid for scrap. It used to be the rule that common iron bars sold at the same price as steel, and quite often they went a dollar a ton lower than steel, while for a year or more common iron bars have been from $3 to $4 a ton above steel. Under present conditions, puddlers are earning $5 net per day, heaters $10, roughers $6, heaters' helpers $2.50, and rollers $25.

Blacksmiths' Agreement at Chicago.

At the meeting of the conference committee of the Chicago Metal Trades Association with the committee representing the International Brotherhood of Blacksmiths' District Council No. 1, held Monday afternoon, April 27, an agreement was entered into for the year beginning May 1, 1903. The demands made by the union, a copy of which was printed in *The Iron Trade Review*, April 23, were modified in a number of particulars. The men asked that none but members of their union be employed; that there be a flat advance of 10 percent in wages; that in all cases of discharge the shop committee may investigate and if it is found that an employe has been unjustly discharged he shall be reinstated; that all overtime beyond the 9-hour day be paid at time and a half until 12 p. m. and then double, and on all legal holidays double. These demands in particular were modified. The men's agreement provided for arbitration, but did not stipulate the method. The following are the features of the agreement as adopted. Article 10 is new. The minimum for hammersmith was 40c in the men's demand:

Article 1. No discrimination will be made against any man because of his membership or non-membership in the International Brotherhood of Blacksmiths; or any of their members. Every workman who elects to work in a shop will be required to work peaceably and harmoniously with all his fellow employes.

Article 2. The standard working time shall be nine hours per day.

Article 3. Helpers will not be advanced to the detriment of blacksmiths. Should a helper be advanced to a fire he shall work for the first six months at his usual rate of wages; should he prove efficient at the expiration of that time, he shall receive an increase of 15 percent and he shall receive an increase of 10 percent every six months thereafter until he receives the wages of a competent blacksmith.

Article 4. All time over the regular nine hour day shall be paid at the rate of time and one-half until 12 o'clock midnight, after which double time shall be paid. In cases of shops running overtime there shall be an intermission of 30 minutes for supper after the regular hours, before starting on the late turn. This shall not be construed to cover emergency cases or on necessary repairs to plant. Regular rates shall be paid on such shop repairs as are necessary to operate such departments as directly affect the employes of this agreement. Double time shall be paid for Sunday and all legal holidays, such as New Year's, Decoration Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas.

Article 5. One (1) apprentice may be employed at each principal shop, irrespective of the number of blacksmiths employed, and one additional apprentice may be employed to every five (5) blacksmiths. This rule is not to affect apprentices in service. Any apprentice shall serve for four (4) years. He shall, in no case, leave the service of the company without just and sufficient cause, and shall receive twelve (12) cents per hour for the first six (6) months, with an increase of twenty-five (25) cents per day every six months thereafter, until he shall have served the required four (4) years. At the expiration of his time he will be rated as a competent blacksmith in his locality, and a service letter shall also be given him at the expiration of his four (4) years' apprenticeship.

Article 6. Hammersmiths shall receive no less than 37½c per hour; blacksmiths shall receive no less than 30c per hour; Bradley hammer men, spring makers, bulldozers, bolt headers and drop hammer men shall receive no less than 30c per hour.

Article 7. A blacksmith shall be considered a competent hand in his class and be able to take a piece of work pertaining to his class and with the drawings or blue prints prosecute the work to a successful completion within a reasonable time.

Article 8. A hammersmith shall be considered a competent hand in his class and be able to take a piece of work pertaining to his class and with the drawings or blue prints prosecute the work to a successful completion within a reasonable time.

Article 9. On and after May 1, 1903, employes affected by this agreement shall receive increase as follows: Class A. All employes receiving under 30c per hour shall be advanced to the minimum scale of 30c per hour. Class B. All employes receiving from 30c to 32½c per hour, inclusive, shall receive an increase of 10 percent. Class C. All employes receiving between 32½c and 35c inclusive, shall receive an advance of 5 percent. Class D. All employes receiving 35c and over shall receive an advance of 2½ percent. Any employe in any of the above classes, receiving more than the above scale, shall not suffer a reduction, and no employe shall work longer than six days without being notified of the rate of wage he is to receive.

Article 10. There shall be no restriction of output nor sympathetic strike, or any further demands made upon the members of the Chicago Metal Trades Association, by the International Brotherhood of Blacksmiths, during the life of this agreement.

Article 11. Should any difference between the parties of this agreement arise which cannot be adjusted between them, it shall be referred to a committee, to consist of four (4) members, two (2) selected by each party, and if they cannot agree, a fifth (5th) member shall be selected by the first four, who shall constitute a committee to adjust said differences, and while this difference and matter is pending before the said committee for adjustment, there shall be no lockout or strike, and the decision of the committee shall be final and binding on the parties thereto; and it is further provided that any ar-

bitration above provided for shall not extend longer than a period of thirty (30) days.

The Union Issue in Pittsburg Machine Shops.

(Special Telegram.)

PITTSBURG, April 29.—A conference Tuesday afternoon between the Manufacturers' Association of Pittsburg and the machinists, to consider the wage scale beginning July 1, arrived at no conclusion and adjourned indefinitely. It still has two months to deliberate. The following official statement is made by the manufacturers:

"A committee representing the Manufacturers' Association of Pittsburg consisting of August Snyder, John Jackson, Geo. Mesta, W. H. McFadden and I. W. Frank met a committee representing the Machinists' Union of the Pittsburg District, consisting of James Flanagan, John Beis, James Garagan, E. H. Mead, H. B. Campbell and Stuart Simpson, Tuesday afternoon, to take up the question of entering into a contract after July 1 which is the date of the expiration of the contract now existing between the manufacturers and machinists of this district. The Joint Committee adjourned indefinitely, as the committee representing the machinists would not agree to the following clause in the proposed contract: 'No person shall be refused employment or in any way discriminated against by either party on account of membership or non-membership in any labor organization.' The committee representing the machinists wanted to substitute the following clause: 'That during the term of this agreement there shall be employed in the shops of the parties hereto only members of the International Association of Machinists or persons agreeable thereto.' To this the committee representing the manufacturers would not agree."

Labor Unions Responsible.

At Indianapolis, April 27, in the trial of an injunction suit, growing out of the strike of the furniture workers at Evansville, Circuit Judge Foster made a ruling that marks a departure in strike cases in Indiana. In sustaining a demurrer of one of the furniture companies, the court held that a labor union, even though unincorporated, may be sued when the suit pertains to questions affecting the relations of the union membership to public safety and order. The ruling is construed to mean that the union, as an organized body, may be held responsible in damages when injury to persons or property results from its action.

Another Unconstitutional "Labor" Law.

In Indiana an act passed by the legislature at the behest of organized labor, was recently declared unconstitutional, as noted in these columns. It required weekly payments of wages. The test suit was brought against the Republic Iron & Steel Co. The Illinois Supreme Court handed down an opinion on April 24 declaring unconstitutional the free employment agency act, which was evidently designed by so-called "labor leaders" as a means of preventing employers with strikes on their hands from finding workmen. The issue had been raised by Murray Matthews, of Chicago, who had been fined for violating a section of the act requiring each person operating a private employment agency to secure a license and to furnish a bond of $1,000 for the faithful performance of the privileges granted under the law. Organized labor was carefully protected under the act. It was this discrimination against employers seeking to fill the places of strikers and against laborers seeking to take the places of strikers that invalidates the law. Referring to section 8 of the act, which prohibits the superintendent of any State employment agency from furnishing names and addresses of applicants for employment to employers whose employes are on strike or are locked out, the court says:

"The act purports upon its face to be a means of assisting persons seeking employment to obtain the same, and also of assisting those who need labor or help to obtain the same and yet section 8 declares that any employer whose employes are on a strike or who have been locked out shall not, when applying for help, be furnished any workmen or other employes. And not only so, but such employers, whose workmen may be on a strike or locked out, shall not be allowed to see any list of names or addresses of applicants for employment. And not only so, but no such list of applicants for employment shall be placed where it can be copied or used by an employer whose employes are on a strike or are locked out. Clearly, the exception contained in section 8 makes the act void as a whole, because that section enters into and pervades the whole act, and cannot be separated from it without defeating the intention of the legislature in passing the act."

Labor Notes.

The molders' union of Springfield, O., has served notice on the founders of that city that an increase in wages amounting to 10 percent is demanded, the new scale to go into effect May 1st. There are about 900 molders in Springfield.

It is almost certain that there will be a general strike of the iron ship-builders of Brooklyn, N. Y., May 1st, when shortening of hours and increasing of wages will be demanded. The most serious difficulty is likely to arise over the men insisting that none but members of the union are to be employed and that sympathetic strikes will not be a violation of the contract.

The iron molders of Milwaukee have asked for the establishment of a nine-hour day, recognition of the union, and an increase of pay of 15 cents a day, effective May 1st.

The strike of structural workers of the American Bridge Co. in New York has been settled. The company says that while it has granted an increase in wages in certain cases it now has better control of the situation than ever before. Many of the company's demands were granted by the workers. The strike has been on for more than six weeks and the loss in wages involved is placed between $2,000,000 and $3,000,000. The settlement of the bridge strike removes one of the most threatening obstacles in the labor situation. Steel men are much encouraged by the outlook, believing the prospects are that there will be few, if any, strikes during the current year.

The boiler makers and boiler makers' helpers at the Torbet & Peckham locomotive works at Hammond, Ind., struck April 23 and the entire plant, employing 300 men, is idle. A readjustment of the wage scale is wanted.

The manager of the plant of the American Car & Foundry Co., at Bloomsburg, Pa., has agreed to operate the foundries under the union system, with a minimum pay of $2.50 for molders, and the stipulation that further difficulties be settled by a conference between the company and the molders.

The demands of the boiler makers and tank builders to become effective on May 1, for 50 cents a day of eight hours, are being considered this week by the blast furnace erectors and stack builders of the Pittsburg district. A conference was held between the manufacturers and the committee from the unions on Monday, when a counter demand from the manufacturers was presented. It is also believed that a satisfactory settlement of this matter will be made before the end of the week.

The annual convention of the Tin Plate Workers' International Association will open Wednesday evening, April 29, at Anderson, Ind. Some of the lodges in the association have instructed their delegates to work for an advance in wages, but if demands for higher wages are made it is understood that they will be very conservative.

Because the company refused permission to organize or recognize labor unions, several hundred employes of the Deering and McCormick Divisions of the International Harvester Co., at Chicago, went on strike last Monday. The companies in the past have not recognized labor organizations, and discovering recently that efforts were being made to unionize their employes, dismissed the leaders. Officials of both companies attach little importance to the outbreak.

For nearly two years the employes of the Chicago Motor Vehicle Co., at Harvey, Ill., have had both Saturday and Sunday off. The firm is controlled by Seventh Day Adventists, and granted its men the two days off each week from religious considerations. As a recompense, the men agreed to work 10½ hours a day. The order was satisfactory until the men became members of unions. At the time other manufacturers were notified, the machinists, molders and brass work-

ers asked for the nine-hour day. This was refused on the grounds that the two holidays each week made conditions different from those in other shops. The firm asked the men to withdraw from their unions. Instead all went on strike last Monday.

The Byram Foundry Co., stove manufacturer, of Indianapolis, has signed an agreement with the molders of the city by which the demands of the men are granted and the foundry will hereafter be operated as a union plant. Under the terms of the agreement the skilled day molders shall not receive less per hour than is agreed upon between the National Founders' Association and the Iron Molders' Union of North America. There are to be three price committees in the shop, each of which has three members, and all disputes concerning the wages to be paid are to be submitted to these committees and a representative of the company.

OBITUARY.

Irving Murray Scott, for many years vice president and general manager of the Union Iron Works, San Francisco, died April 28, at his home. He had long been a sufferer from kidney disease, but his illness became alarming only a few days ago. He was born at Hebron Mills, Md., Dec. 25, 1837, was educated in Baltimore public schools and Mechanics' Institute and was employed for several years in Baltimore as a draftsman. He went to California in 1858 and was employed as a draftsman in the Union Iron Works, where he later became superintendent and a partner. He designed machinery for working the Comstock mines; invented improved cut-off engines; was for several years president of the Mechanics' Institute of San Francisco; was prominently mentioned as a candidate for the vice presidency on the ticket with McKinley in 1900, twice a formidable aspirant for the senatorship, and for many years a leading figure in the business and political life of California. He was one of the most progressive shipbuilders in the world, and besides constructing the Oregon his company built other vessels of the American navy, and filled contracts for the navies of Japan and Russia.

George Willis Bement, secretary and treasurer of E. Bement's Sons, manufacturers of agricultural implements and stoves, Lansing, Mich., died April 19, aged 53 years. Mr. Bement was born in Fostoria, O., and had lived in Lansing since 1870, the concern, which has become one of the leading manufactories of Michigan, having been established by his father in 1869. Mr. Bement was very successful in business and had been active in church and charitable work.

James Woodruff, head of the J. Woodruff Foundry Co., Salem, O., died April 21, aged 86. In 1838 he established the foundry, which is the oldest business concern in Salem.

William Strang, one of the best known furnacemen in the employ of the Carnegie Steel Co., and for the past 17 years in charge of the Edgar Thomson furnaces at Braddock, Pa., and assistant to the superintendent of the entire steel plant, died suddenly on April 21, at his home in Braddock, at the age of 46 years. He is survived by his wife, four daughters and one son.

George W. Barr, for many years a resident of Pittsburg, died April 21 at his home in Philadelphia, of heart trouble. Mr. Barr was one of the founders of the Crescent Steel Co., under the firm name of Miller, Barr & Parkin. He retired from active business life some years ago.

George S. Scott, Chicago representative of the *Mining and Scientific Press*, of San Francisco, and J. Winchester Holman, Western manager of the *Engineering and Mining Journal*, of New York, have resigned their positions and have purchased the *Western Mining World*, of Chicago. The name of the paper has been changed to the *Mining World*, to include all branches of the mining industry, and it will be improved and enlarged. Both gentlemen are well known in the mining machinery trade, Mr. Scott having represented the *Engineering and Mining Journal* in Chicago territory for twelve years prior to his connection with the *Mining and Scientific Press*, while Mr. Holman was connected for a number of years with *Mining and Metallurgy* before its absorption, and later succeeded Mr. Scott as the representative of the *Engineering and Mining Journal*.

THE STEEL CORPORATION SYNDICATE.

Circular letters dated April 25 and signed by J. P. Morgan & Co., have been sent to members of the syndicate which financed the United States Steel Corporation, announcing a further cash dividend, and the turning over of the remaining profits to the bond conversion syndicate. The original syndicate members bound themselves to a total of $200,000,000, of which $25,000,000 was put up, the members holding themselves ready to supply the remaining $175,000,000, but it was never called for. The original $25,000,000 was subsequently returned, and later a distribution of $40,000,000 profit was made. It is now announced that the remaining profits of the old syndicate amount to $11,000,000, and of this amount $6,000,000 is to be distributed in cash, and the other $5,000,000 turned into the bond conversion syndicate, subscribers to the old syndicate being given certificates of participation in the new one.

The bond conversion syndicate put up $80,000,000 par value of preferred stock, and agreed to furnish $20,000,000 cash, in return for which it was to receive $100,000,000 of the new 5's. The corporation, however, offered to stockholders at large the privilege of subscribing for bonds to the extent of 40 percent of their preferred stock holdings, and further, if they desired, bonds for cash to the extent of 10 percent of their preferred stockholdings. Should all stockholders accept both options, there being about $430,000,000 not locked up, this would have taken $215,000,000 of bonds, and the corporation reserved the right to give such stockholders the bonds, cutting down the syndicate's share from $100,000,000 of bonds to $35,000,000. The outcome, however, was the reverse of this, many stockholders not taking even their quota of bonds in exchange for stock, and none taking bonds for cash. Thus the syndicate must take $100,000,000 of bonds, putting up the $80,000,000 of preferred stock and $20,000,000 in cash.

Unless some further arrangement is made, the whole $250,000,000 of new 5's will not be taken. Of the $50,000,000 which were to be issued for cash, it appears that only $20,000,000 will be taken, while of the $200,000,000 to be issued for stock something less than all will be taken. Thus the issue of new 5's will lie somewhere between $200,000,000 and $220,000,000.

Should the syndicate market the bonds at 85 for which it pays par, it would lose by the transaction $3,000,000, while it may also be held to lose something on the preferred stock locked up for about a year, which stock was worth over 90, and is now worth about 84. Against these losses the syndicate will receive a 4 percent commission on not less than $100,000,000 of new bonds, or not less than $4,000,000.

Iron and Steel Institute Meeting in United States.

Plans are being matured for holding the autumn meeting of 1904, of the Iron and Steel Institute in the United States. This will be the second year of Andrew Carnegie's presidency of the institute. It is probable that the meeting will be held in the latter part of October and that one of the trips will be to the St. Louis exposition. The headquarters of the meeting will be in New York for a portion of the time and part in Pittsburg, and as in 1890, the year of the last visit of the Iron and Steel Institute to the United States, arrangements will be made for a number of excursions to important districts. In 1890 these included the Lake Superior region and the Birmingham district besides Pittsburg and Chicago. Mr. Charles Kirchhoff, editor of the *Iron Age*, is honorary organizing secretary for the preliminaries in this country.

A number of Cleveland men including Vernon H. Burke, Alex. Hoyt and J. L. Jacobs, associated with citizens of Peoria, Ill., have organized the Peoria Car Co., and expect to build a plant for the manufacture of cars for steam and electric railroads. The company's capital will be $1,000,000. Mr. Jacobs will be the general manager.

CENTRAL AND EASTERN PENNSYLVANIA.

HARRISBURG, April 28.—It has been reported that the Eastern Steel Co., which is rehabilitating the plant of the Pottsville Iron & Steel Co. and making extensive alterations, is seeking to form a consolidation of several concerns. The Tidewater Steel Co. has been mentioned as one but President Stafford says that there is nothing in the report. Officials of the Susquehanna Iron & Steel Co. refuse to discuss it.

Almost every furnace in the eastern part of the State is being worked and some which are idle are only quiet until the repairs can be made. The larger companies report considerable new business and a brisk inquiry for new work, particularly construction of buildings and bridges.

Within a short time the Pennsylvania railroad will begin the erection of large shops at Enola near this city. Immense classification yards are being built along the west bank of the Susquehanna to handle traffic which now congests five miles of yard in Harrisburg. A large amount of traffic will eventually go down the west bank of the river. The shops will be for repairs and general railroad work.

The Chester Iron & Steel Co. has suspended operations at Chester for alterations and improvements which will considerably increase its capacity.

The York Variety Iron Works is to be incorporated with a capital of $200,000. A considerable sum will be expended upon improvements.

The Lalance & Grosjean Co. has purchased a tract of land adjoining its tin plate works in this city and will start on additional buildings in the next year. The company has installed a foundry and contemplates a steel plant at some time in the future.

All the seven blast furnaces in Dauphin county are in operation and in Lebanon county the whole dozen stacks will be blowing in another month. The furnaces of the Susquehanna Valley are generally in operation.

The Lackawanna Steel Co. has started another battery of coke ovens at Lebanon. The coke will be used in the Colebrook and Cornwall furnaces.

The Louisville & Nashville railroad company has placed a contract for bridge work with the Pennsylvania Steel Co. The order will include work for this summer—a number of bridges to be constructed and renewed.

The Reading Iron Co. has finished the 55th cotton press at its Scott works at Reading. These huge presses weigh over 200,000 pounds and are valued at $25,000 each.

The Fleetwood Foundry & Machine Works have been organized and has taken over the business of Schaeffer, Merkel & Co. in Berks county. The president is H. L. Rummel; W. H. Zechman, secretary, and E. R. Kemmerer, treasurer.

The William Adams Foundry, of Philadelphia, has been granted a charter by the State of Pennsylvania. It has a capital of $150,000, and the directors are William Adams, W. H. Hunt, J. K. Bougher and E. T. Dinlay, of Philadelphia.

J. R. Jackson, of New York, M. F. Straus, of Philadelphia, Pa., and Lakin Taylor, of Cambridge, O., have purchased control of the Tuscora Steel Co., at Newcomerstown, O. At the stockholders' meeting held April 22, the following officers were elected: President, M. F. Straus, Philadelphia; vice president, J. R. Jackson, New York; secretary and treasurer, Lakin C. Taylor, Cambridge; attorney, John S. Black, Cambridge. The new owners intend to enlarge the Newcomerstown plant by increasing the number of mills to five, adding galvanizing and steel roofing departments. The same people control the Marietta Sheet & Tin Plate Co., at Marietta, and are heavily interested in the Cambridge-Byesville Steel Co., which will now be enlarged to furnish the necessary supply of billets, sheet and tin plate bars for both the Marietta and Newcomerstown mills. The construction of the Byesville plant is to be pushed to completion.

John Black, of the firm of John Black & Co., Victoria, B. C., is authority for the statement that English capitalists who are interested in iron properties in Vancouver Island, are figuring on the erection of a rolling mill on the Island and the building of other plants.

LAKE SUPERIOR IRON MINES.

All mines of the United States Steel Corporation on the Vermillion and Mesabi ranges are now being operated.

John P. Morrow is reported to have made a strike of iron ore on one of the eighty-acre tracts in the lands controlled by the Niagara Iron Co., on which he has an option. No estimate is given as to the amount of ore, but it is evidently a deposit of considerable size. The find was made in the east half of the southeast quarter of 24-57-22. This is in the same section that E. F. Sweeney discovered a mine a short time ago. The find made by Mr. Sweeney is in the south half of the northwest quarter. The Prindle eighty, which was taken over by the Oliver-Snyder people, is also in 24 and is the south half of the southwest quarter.

Hard ore taken from the Highland range was analyzed in Duluth a few days ago and was found to contain 66.80 percent iron. The sample was from the property of W. F. King and associates in 28-55-11 and from a pit 24 feet in depth. Samples of soft ore taken from 3 and 4-54-11, owned by the same parties, ran 58.40 in iron and .034 in phosphorus. This was taken from a pit 17 feet deep. In the explorations thus far a churn drill has been in use, but within a few weeks diamond drills will be put in.

Reports from many mines indicate that there is not this spring the usual activity in shipping ore. The *Diamond Drill*, of Crystal Falls, Mich., says: "Not for many years have the mining companies been so slow in starting to ship the products of their mines. As a general thing the companies are anxious to get the ore going forward and just as soon as the surroundings are cleared of snow the cars are backed under the pockets and the ore starts dockward. This year there is a change. But little ore has gone forward to date, the Crystal Falls and the Bristol being the only properties that did any forwarding o ore until last Monday, when the Tobin and the Western joined the pair, the latter sending out Basic ore only. Part of this backwardness is due to the engineers' strike, which has delayed the starting out of boats, and partly to the unfavorable conditions of the ore market."

The Laura, Mesabi range, expects to ship 200,000 tons this season. It has one shaft, which is 100 feet deep. Its neighbor, the Winifred, has about the same development and equipment, but will not ship as much as the Laura. Both are Corrigan, McKinney & Co. properties.

There are about 900,000 tons of ore in stock piles at Eveleth, Minn., and shipping is progressing slowly. The stocks are about as follows: Adams, 400,000 tons; Spruce, 200,000; Fayal, 250,000; Cloquet, 50,000. At the Fayal, a new shaft is to be sunk this year. There are now three shafts. The Troy, a short distance south of the Fayal, is about to become a shipper.

The Hawkins, on the Western Mesabi, has 75,000 tons of ore in stock and will ship freely this year.

The Shenango mine, Mesabi range, began shipping this week, sending out two grades of ore. The mine is still very wet and a new pump is being installed. The St. Clair, also a new mine, has just begun shipping.

Supt. C. E. Walton, of the Hawkins mine, has been appointed superintendent of the La Rue, near by.

An experimental plant to demonstrate the proposed system of washing sand from ore is to be installed at the Arcturus property.

W. L. Grace, of St. Louis, is in Austin, Tex., investigating the advisability of organizing a company to engage in the business of manufacturing iron in that locality. Mr. Grace says that he and his associates have under consideration the purchase of the Tassie Bell furnace property of the New Birmingham Iron & Land Co., near Rusk, Tex., or the Star and Crescent furnace property of the Cherokee Iron Mfg. Co., which is also located near Rusk. Mr. Grace is anxious to have some tests made at the penitentiary furnace at Rusk, to ascertain what can be done in making certain high grades of car wheel iron.

The Virginia Iron, Coal & Coke Co. has sold the Embreville furnace, near Johnson City, Tenn., to Messrs. Perin and Echols, of New York City.

THE PICH PROCESS FOR BRAZING CAST IRON.

On the evening of Tuesday, April 7, at New York, a paper briefly presenting the features of the Pich process for brazing cast iron, by Wilfred Lewis, of Philadelphia, was read by the secretary of the American Society of Mechanical Engineers at its monthly meeting. The process was illustrated and examples of the results presented to the members present. The general scheme of the process is, first, the use of a coating over the surface to be joined. This coating is a metallic oxide (usually the oxide of copper) made into the constituency of varnish by some suitable liquid and applied on the surface with a brush. The effect of the metallic oxide is to act as a reducer of the carbon on the surface of the cast iron to be brazed, so that it passes somewhat towards a condition of carbon steel. Without this treatment, a sort of greasy condition of surface prevents adhesion. This reduction seems to penetrate for some distance (even three or four inches) into the actual texture of the cast iron, the graphite disappearing under the action of the heat applied by a gas and air torch. The ordinary brass filings usual in any brazing process, are then laid upon the fracture, and melt into the joint at a temperature of about 1,800 degrees F., making a union which is as strong, or stronger, than the original texture of the cast iron. As presented before the society the pieces broken were an inch wide by one-half inch thick, and the brazing was effected in a small muffler made of fire-brick. The brazed pieces, when broken, parted in another section from that in which the first break appeared. The process took about 20 minutes for the small pieces which were used in illustration.

It was explained that the process could be applied to mend the break in broken teeth of gears, in pulley or wheel castings, and in massive work, even up to the size of a casting of a good-sized shears or punch. The cost of the material, exclusive of the labor necessary to apply the process, was about one-half cent per square inch. Its application was explained further for the making of one massive casting out of parts which it was convenient to cast separately, and also one of the newest developments, which was to fill blow-holes in massive castings. The surface of the cavity was coated with metallic oxide, which is known as the "ferrofix," and after being brought up to the brazing temperature, melted cast iron from the ladle was poured into the cavity. It united either with or without the use of the spelter or brass filings, and when broken the metal was stronger where the blow-hole had been, and the union so perfect that even with a strong glass, no trace of the brass film could be detected in cases where brass spelter had been used.

Quantitative tests on duplicate samples seemed to indicate that after the reduction and brazing process, the strength of the casting was greater by five or ten percent in many cases than it was in its natural state, or where it had not undergone the reducing treatment.

No claim was made for increased strength at the joint where the tensile strength of the original material was higher than the strength of the fused brass; but in cast iron where the brass used was stronger than the casting originally, this effect could be produced every time with a joint properly brazed. The applicability of the system to brackets or inconvenient projections on castings, was also referred to. There seems to be no limit as to size of the castings to which it can be applied. The time required varies with size and the number of torches to be used—from five minutes to two hours.

The Wheeling Steel & Iron Co., Wheeling, W. Va., has just completed a contract for almost 18 miles of pipe to be used in hydraulic mining by a mining company located near the Chilcoot pass in Alaska. The pipe weighs almost 500 tons and made a solid train of twenty or twenty-one cars, which was started by the Wheeling & Lake Erie Ry. Co. last week. It will go by rail to Seattle, Washington, and from there by steamer to Nome, Alaska. The freight rate from Wheeling to Seattle on this kind of material is sixty-five cents per 100 pounds, making the cost to that point $6,500. The rate from Seattle to Nome is estimated to reach the same amount as the transportation by rail, making a total freight cost of $13,000.

ESTIMATION OF CARBON BY COMBUSTION.*

BY HARRY E. WALTERS.

In an article entitled "Carbon Combustion in a Platinum Crucible," by Dr. P. W. Shimer, the author states that in some experiments made to determine how near the carbon could be determined by use of the crucible without a cupric oxide tube, it was found that only about 90 percent of the carbon was oxidized to carbon dioxide and determined. As this is a point which has been discussed at our meetings for some time, it was thought that some experiments which have been carried on in our laboratory to see if the presence of copper oxide was necessary in making combustions in a platinum tube and also to shorten the time of combustion, might prove of interest to the members of this society. The method which we had been using was the combustion of the carbonaceous residue after solution by the standard method, 15 minutes with oxygen and then 10 minutes aspiration with air, using barium hydrate as the absorbent, but recently we have been combusting 10 minutes with oxygen and aspirating 5 minutes with air without using copper oxide.

In these experiments samples were picked out so as to give a wide range in carbon and silicon contents. They were then treated as usual until the carbonaceous residues were obtained and then combusted without drying, as follows: First, copper oxide was introduced into the platinum tube and the carbonaceous residues were combusted 10 minutes with oxygen and then aspirated 5 minutes with air. Second, the copper oxide was removed and the carbonaceous residues were then combusted 8 minutes with oxygen and aspirated 4 minutes with air. Third, the residues were combusted as in the second experiment, with the exception that air was used for both the combustion and aspiration.

Following are some of the results:

COMBUSTIONS.

Sample.	10 Min. Oxygen. 5 Min. Air Aspir. Copper Oxide Present.	8 Min. Oxygen. 4 Min. Air Aspir. No Copper Oxide.	8 Min. Air. 4 Min. Air Aspir. No Copper Oxide.
Steel No. 1.....	.56	.562	.568
Steel No. 2.....	1.059	1.064	1.061
Cast Iron Std.....	2.305	2.334	2.306
Pig Iron Std.....	3.399	3.435	3.435
Pig Iron No. 1.....	4.086	4.092	4.098
Pig Iron No. 2.....	2.772	2.815	2.797
Pig Iron No. 3.....	3.295	3.283	3.277
Pig Iron No. 4.....	3.144	3.168	3.138
Pig Iron Std..... Graphitic Carbon....	2.967	2.985	2.979

A glance at the above results shows: First—That there is practically no difference in the results whether copper oxide was or was not used. Second—That air may be used as safely as oxygen. Third—That while the time of combustion used is much shorter than used by the chemists at large it is amply sufficient.

In conclusion I wish to say that in using this method of combustion one man can easily make 30 to 35 determinations with one tube in a day of nine hours, and I also feel safe in saying that in combusting steels the time can be shortened more.

The paper was discussed by the members present, the desirability of finding some means of shortening the time of the operation without detracting from the accuracy being dwelt upon. Prof. Phillips suggested titrating the solution of barium hydrate with some solution other than oxalic acid, as generally used.

Officials of the American Steel Foundries say that the earnings for the quarter ending March 31 were larger than those of the preceding period, and that the company is now earning 6 percent on the preferred and 8 percent on the common. Estimates place the profits by the first of next year between $2,500,000 and $3,000,000.

The Shelby Iron Co. has declared a dividend of 10 percent, payable May 15. This is an increase of 4 percent over the dividend declared last October, and compares with 5 percent and 5 percent extra at this time last year.

*Read before the Chemical Section of the Engineers' Society of Western Pennsylvania.

STEEL RAIL MANUFACTURE IN CANADA.

The tariff resolution offered in the Canadian parliament by the finance minister, Mr. Fielding, has aroused an interesting discussion among Canadian manufacturers, iron and steel experts and politicians as to the possibility of manufacturers being able to meet the conditions laid down by Mr. Fielding. The resolution provides for the imposition of a duty of $7 per ton on iron and steel rails, provided, however, that the order for the imposition of the tariff shall not be passed "until the Governor in Council is satisfied that steel rails of the best quality, suitable for the use of Canadian railways, are being manufactured in Canada, from steel made in Canada, in sufficient quantity to meet the requirements of the market."

J. H. Means, who has recently inspected the properties at the Soo, declares that all idea of manufacturing coke iron at that place must be abandoned, as only charcoal iron can be made. G. E. Drummond, managing director of the Canada Iron Furnace Co., who has been engaged in the manufacture of iron for many years, indorsed Mr. Means' opinion, but said that within three months, Mr. Clergue's company would be manufacturing rails from charcoal iron and in that way would take advantage of the duty. He admitted that charcoal iron is very costly to produce, but said that by the sale of by-products additional profit would be realized, so that the company could afford to manufacture rails from this expensive iron.

A correspondent of the Montreal *Herald*, who signs himself "An Engineer," comments as follows on Mr. Drummond's assertion:

"Everyone in the trade knows that charcoal iron, even in the form of pig, which is its crudest form, ranges from $6 to $10 higher in value than ordinary coke pig, and that at the present time the market value of best charcoal pig is in the neighborhood of $25 per ton, which is $2 a ton more than the price now being paid in Canada for German steel rails. It is doubtful if at any time a charcoal pig can be produced to cost less than $15 a ton, a figure at which, when the present boom in the iron and steel trades subsides, it is not unlikely that our American competitors will sell steel rails, just as they did three or four years ago. [The lowest price was $17 at mill, and this was in 1897 or six years ago.—Ed.] It is hardly a practical proposition, therefore, to suggest that any manufacturing concern either could or would produce a finished article from a raw product which is worth practically as much as the finished article itself. As to Mr. Drummond's suggestion that the extra cost of production would be offset by the sale of by-products, I am not aware that there is any by-product from the manufacture of charcoal iron, but there is a well known by-product from the manufacture of charcoal itself, and if this is what Mr. Drummond has in mind, I can only say that the product, viz., pyro-ligneous acid, would be practically unsalable if produced. There is a small demand for it in the large cities in connection with printing. It is worth in New York as a rule about 6 cents per pound, which would give say 5 cents at the lakes. Now if it were possible to treat a sufficient quantity of charcoal to manufacture about 150,000 tons of rails a year the production of pyro-ligneous acid would be so enormous that it would far exceed the requirements of any possible market. But the suggestion is altogether impracticable, as I shall proceed to show. To manufacture 500 tons of rails per day by this process would require 800 tons of charcoal. To produce this would require 1,600 tons of hard wood, a quantity which is entirely beyond the capacity of any one district to yield or of any one enterprise to handle. To any practical charcoal burner the figures present an unsurmountable obstacle, and whatever may be said about the extensive timber limits of the Lake Superior Consolidated Co., I challenge any competent authority to prove that it is physically possible, day after day, and year after year, to produce this quantity of charcoal in one district.

"There is, however, a further difficulty of quite as serious a character—the metallurgical one. The manufacture of rails from charcoal iron is a thing of the past. I make bold to say that with one single exception, and that a failure, no attempt has been made to produce rails from charcoal iron for a quarter of a century or more. Before the advent of the Bessemer and Siemens-Martin processes, iron rails only were used, but they were speedily ousted when steel became a marketable commodity, and if there were no other objection, railway companies could not be found today willing to purchase a charcoal iron rail in consequence of its softness and lack of durability in comparison with steel. On the other hand, to convert charcoal pig to steel for rails is impracticable, the physical structure of this pig being so different from coke pig that in the converting it cannot be satisfactorily treated for this purpose, and I think I am correct in stating that there is no place in the world where charcoal iron is being converted into steel today for the purpose of manufacturing rails."

The *Herald's* correspondent also gives reasons for Mr. Means' statement that coke iron can not be made at the Soo from native ores, urging that Canadian ores are high in sulphur and phosphorus and if smelted with coke—all coke containing sulphur—would give an iron too high in sulphur.

General Manager Baker, of the Dominion Iron & Steel Co., contributes an interesting chapter to the controversy by saying that that company will not carry out the original plans for a rail plant and telling why, in his opinion, it would be impossible to do so. He points to the fact that rail competition in this line will come neither from Germany nor England, but from the United States, and that there may again be seen what was seen three years ago, viz.: steel rails selling at $15, at the works. Mr. Baker says that even with $14 protection, Canadian producers could not meet the prices which might be made by those of the United States. The *Herald's* correspondent, above quoted, in commenting on Mr. Baker's statement, says:

"It could hardly be expected that he would give to the public the fullest information affecting the ore deposits of his company, but they are practically in the same position as the Lake Superior Co. in having in their Belle Isle deposits an ore containing so high a percentage of phosphorus and so low a percentage of metallic iron that it is not likely that by any mode of treatment they could produce a marketable rail. When the Dominion Iron & Steel Co. commenced operations they did so upon assays showing at least 55 percent of metallic iron in their ore. Their present shipments and indeed the shipments for some time past have averaged 10 percent less than this, whilst there has been no diminution in the percentage of phosphorus. Mr. Moxham's idea of eliminating the phosphorus, like many of his predictions, has not materialized, and the only way in which the Dominion Iron & Steel Co. could by any possibility manufacture steel rails of satisfactory quality would be to import the bulk of their ore. This, however, is not possible, both because there is a dearth of such class of ore and because it would be too costly to enable them to use it and compete with their American neighbors. In directing their attention to the manufacture of steel products of lower grade, and which in their use are subjected to less severe tests than steel rails, they are undoubtedly wise, but even here I entirely agree with Mr. Baker that American producers will always be able to undersell them in Canada unless there is very heavy protection."

Sharon Steel Hoop Co.

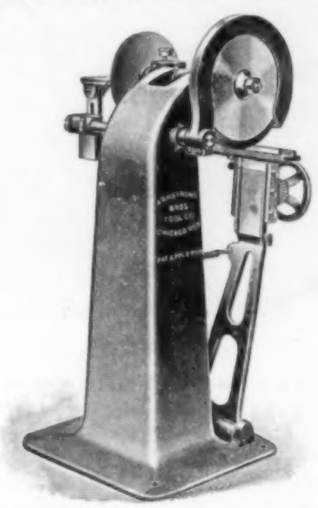
Operations were commenced at the new plant of the Sharon Steel Hoop Co., Sharon Pa., this week. Two of the four open-hearth furnaces were placed in operation and the remaining two will be placed in operation within a month. The furnaces have a capacity of 35 tons each and when in complete operation the daily output of the plant should average 250 tons. The blooming and billet mills have also been placed in operation. Billets from 1½ to 4 inches will be rolled, as well as sheet and tin bars. The furnaces will all make acid steel as the sheet trade now prefers this to basic for a large number of purposes. The company's own hoop, band and cotton-tie plant will consume about 125 tons of steel daily and the remainder will be offered in the open market.

The plant of the Chalfont Mfg. Co., Lancaster, Pa., was sold at receiver's sale recently, the purchaser being John H. Mueller, president of the Independent Foundry Co., of Rochester, N. Y. The price paid was $13,700. The plant will be reopened at once.

ARMSTRONG CUTTING-OFF MACHINE.

A cutting-off machine having some peculiar features has been designed by the Armstrong Bros. Tool Co., of Chicago, for the purpose of cutting off self-hardening steel. The tool works with rapidity, accuracy and economy, and an application has been made for a patent on the device. A representative of *The Iron Trade Review* visited the plant at Chicago some time ago and had an opportunity of examining the machine and its work. The manufacturers are well known as makers of tool holders and have found it necessary to devise some ready means of cutting up large quantities of self-hardening steel into cutter lengths. Their experience has convinced them that this class of steel gives better satisfaction when cut off cold. The ordinary shop practice has been to cut the steel off hot or to break it off on the anvil. In the latter case the break is liable to be very irregular and this results not only in a serious loss of steel but also in a largely increased grinding, with much waste of time and emery wheels. Experiments with various methods of doing this work have resulted in the development of the machine which is illustrated, and which in a slightly different form has been in use in the shop for about two years with practically no expense for maintenance.

The cutting is done by a disc of special grade tool steel revolving at high speed. Any attempt to cut soft steel or ordinary cast steel with a disc is found to result in a rough dragging cut with flaring lips which bind the disc to such an



THE ARMSTRONG CUTTING-OFF MACHINE.

extent as to reduce its speed to a point where it is ineffective, even if it does not actually bend or break. Owing to the peculiar nature of self-hardening steel, however, it is not affected in a like manner by the cutting disc, which produces in it a clean incision, even when the cutter is crowded. The periphery of the disc is coated with particles of self-hardening steel and these particles do the actual cutting.

Numerous inquiries have been received from machine shops in every part of the world regarding the shop method of cutting off self-hardening steel, and the firm has decided, therefore, to place the machine on the market. Of course it will have a special use where tool holders of the Armstrong brand are commonly employed, but the convenience and economy of the device will make it serviceable generally.

It will be observed that the machine is of combination form, the steel-cutting disc being mounted on one end of the spindle while the other end carries a 12-inch grinding disc. The speed at which the machine is intended to run is such as to give the best results for both operations. As for the construction of the machine: The spindle is of tool steel ground true. Bearings are cast iron and are dust proof, with convenient and positive adjustment to take up lost motion. The swinging table is provided with a length gauge and is conveniently adjustable for steel of different sizes or depth of cut. The cutting disc is provided with a neat guard which can easily be swung back out of the way when changing the disc.

The grinding disc is made of boiler plate and is provided with an adjustable table so located that the operator will not interfere when cutting off long bars of steel. Each machine is equipped with counter shaft, one cutting disc, one grinding disc, one breaking block, one press for emery discs, one dozen emery-cloth discs assorted, one pound of lubricating grease and one can of special cement for attaching emery cloth to grinding disc.

PENNSYLVANIA STEEL CO.'S REPORT.

The annual report of the Pennsylvania Steel Co. for the year ended Dec. 31, 1902, makes a favorable showing. Net earnings exceeded those of the previous year by $811,591, while the surplus, after deducting interest on bonds, depreciation and dividends paid to the Pennsylvania Steel Co., of New Jersey, was larger by $285,275. At the annual meeting Frank J. Firth, Francis J. Gowen, Edgar C. Fenton, Effingham B. Morris and Frank C. Smith were re-elected directors to serve for three years by a vote of 250,677 out of 272,500 votes. The detailed financial statement for the past year is as follows:

	1902.	1901.	Increase.
Net. earnings	$3,690,864	$2,879,273	$811,591
Other income	274,187	323,579	*49,372
Total income	$3,965,051	$3,202,832	$762,219
Interest on bonds and debt	671,434	550,114	121,320
Net income	$3,293,617	$2,652,718	$640,899
Depreciation	820,085	491,211	328,874
Balance	$2,473,532	$2,161,507	$312,025
Dividends paid Penn. Steel Co., N. J.	1,177,500	1,150,750	26,750
Surplus	$1,296,032	$1,010,757	$285,275

* Decrease.

President E. C. Fenton in his report to stockholders says in part: "During the year the Pennsylvania Steel Co. of Pennsylvania completed its purchase of certain interests in the Cornwall ore banks, near Lebanon, Pa., and now owns 40-96ths of that property, together with a two-thirds interest in the Cornwall & Lebanon Railroad, and two modern blast furnaces at Lebanon. Bonds of the Pennsylvania Steel Co. specifically secured by mortgage on these properties, were issued October 1st last to the amount of $7,500,000, to pay for them and for by-product coke ovens to be erected at Lebanon.

"The Maryland Steel Co. has continued during the year the building of by-product coke ovens, which will have a capacity of about 1,000 tons of coke per day and will supply about three-fourths of the coke consumed by its blast furnaces. It has also improved and enlarged the equipment of its steel and rolling mills. It purchased during the year 500 steel coal cars, paying for the same by an issue of $600,000 car trust certificates. The shipyard has increased the size of its launching ways and made other improvements. This department completed during the year two 12,000-ton twin-screw freight steamers and three torpedo-boat destroyers, and a large floating dry dock for the United States Government.

"The Baltimore & Sparrows Point Railroad, the securities of which are owned by your company, was successfully operated during the year. The double-tracking of its line and bridges was completed, the cost of these improvements being charged to operating expense. The end of the year finds the plants of all of these subsidiary companies in excellent condition and capable of producing a much larger output than during 1902. It is expected, however, that profits will be reduced owing to the very considerable advances which have taken place in the cost of fuel and in freight rates. No important additions or improvements are at present in contemplation other than the building of by-product coke ovens at Lebanon; these will cost about $800,000, which amount is in hand for the purpose.

"The operating companies owned have, after paying interest on bonded indebtedness and after charging to general and special depreciation $1,533,481, earned net, $2,473,532, out of which this company has received in dividends $1,177,550, and the balance, $1,296,031, has been retained by the operating companies for additions to plant and to working capital. In addition to the $820,085 charged to general depreciation by the operating companies the sum of $713,396 was charged into their costs of manufacture. This amount was spent either for permanent improvements or charged as a special depreciation to particular departments or to railroad equipment."

Open-Hearth Plant and Rod Mill of Wickwire Bros.

The plant of the Wickwire Bros., at Cortland, N. Y., is a good example of development from the finishing end of the iron trade toward the production of the raw materials of the original industry. As the more important producers of steel in the United States have ceased to be purveyors of semi-finished materials for industries that have confined their activities to finishing processes, the latter have found it desirable either to dispose of their plants to the consolidations, as was done by many sheet, tin plate, tube and wire manufacturers, or to provide their own sources of raw material. To users of steel the open-hearth furnace was the natural recourse; small units could be built, and the choice of materials had some range.

Wickwire Bros. began manufacturing wire cloth on a single hand loom in 1876, buying their wire in the market. Four years later they took the first step in the direction of providing their raw material. Wire blocks were then installed and wire drawn from rods purchased in the market. For 20 years the concern was a buyer of rods, the wire drawing plant being increased from the small proportions of 1880 by successive stages. A Morgan rod mill was built in 1899, details of which are given below, and in February, 1900, the first wire rods were rolled. Later a basic open-hearth steel plant and blooming mill were undertaken, the first furnace being started in February of this year and the second early in the present month.

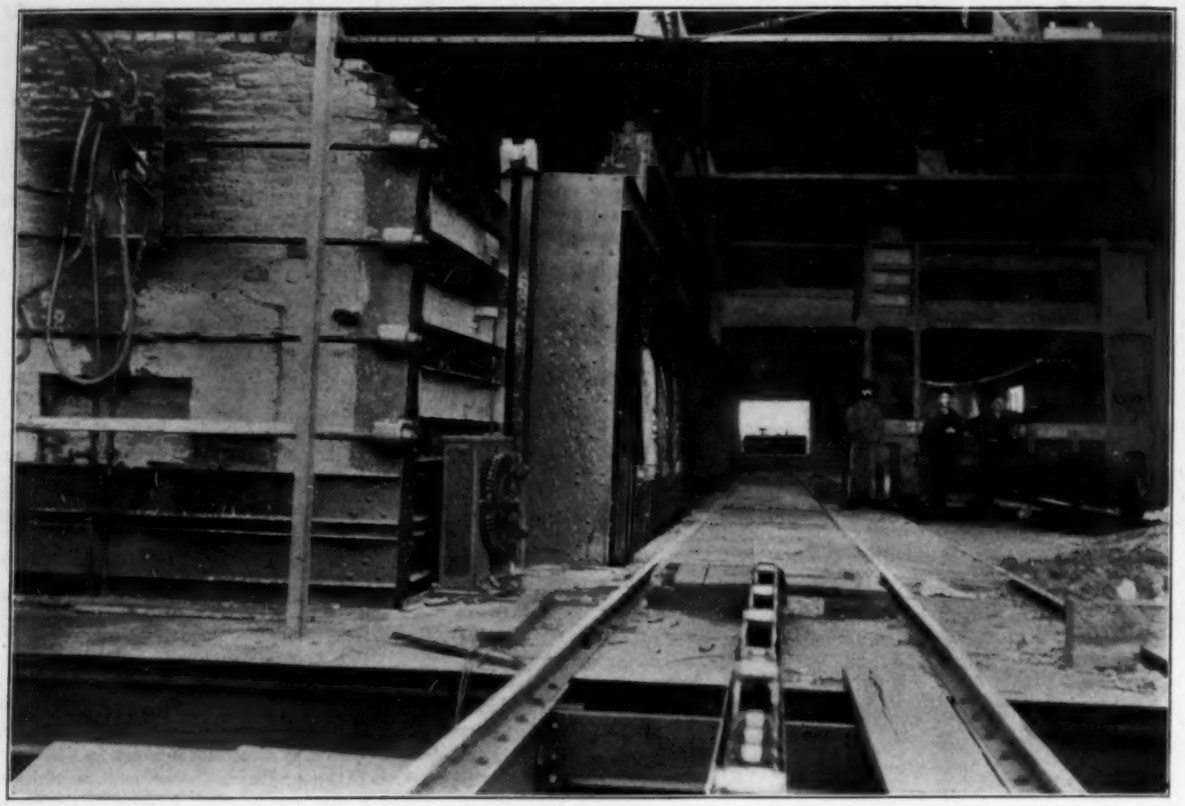


FIG. 1.— VIEW OF OPEN-HEARTH FURNACES, CHARGING SIDE, SHOWING TOP OF ELECTRIC INCLINE LEADING FROM STOCK YARD, ALSO METHOD OF FEEDING FUEL OIL.

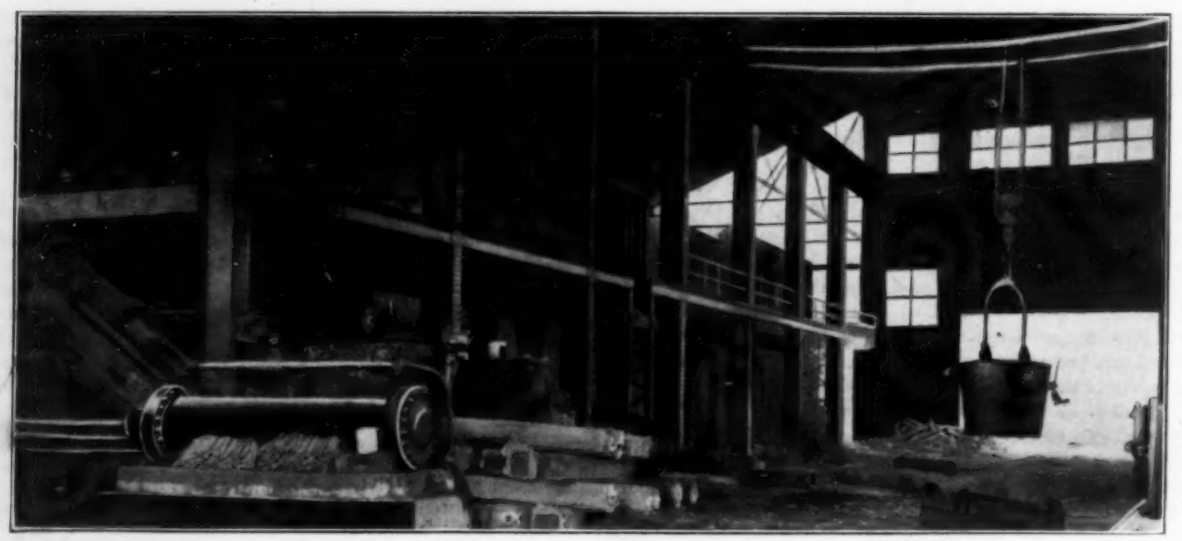


FIG. 2.—OPEN HEARTH FURNACES, POURING SIDE.

The principal lines of manufacture at the Wickwire Bros.'

plant are wire cloth of different descriptions (principally screen cloths), wire nettings of all grades, wire nails and market wire —the whole representing a daily output of about 75 tons. In addition some rods are sold in the market. With the new open-hearth plant in full operation the company will increase its output about 50 percent. There are now employed about 1,200 persons and the number is being increased from time to time.

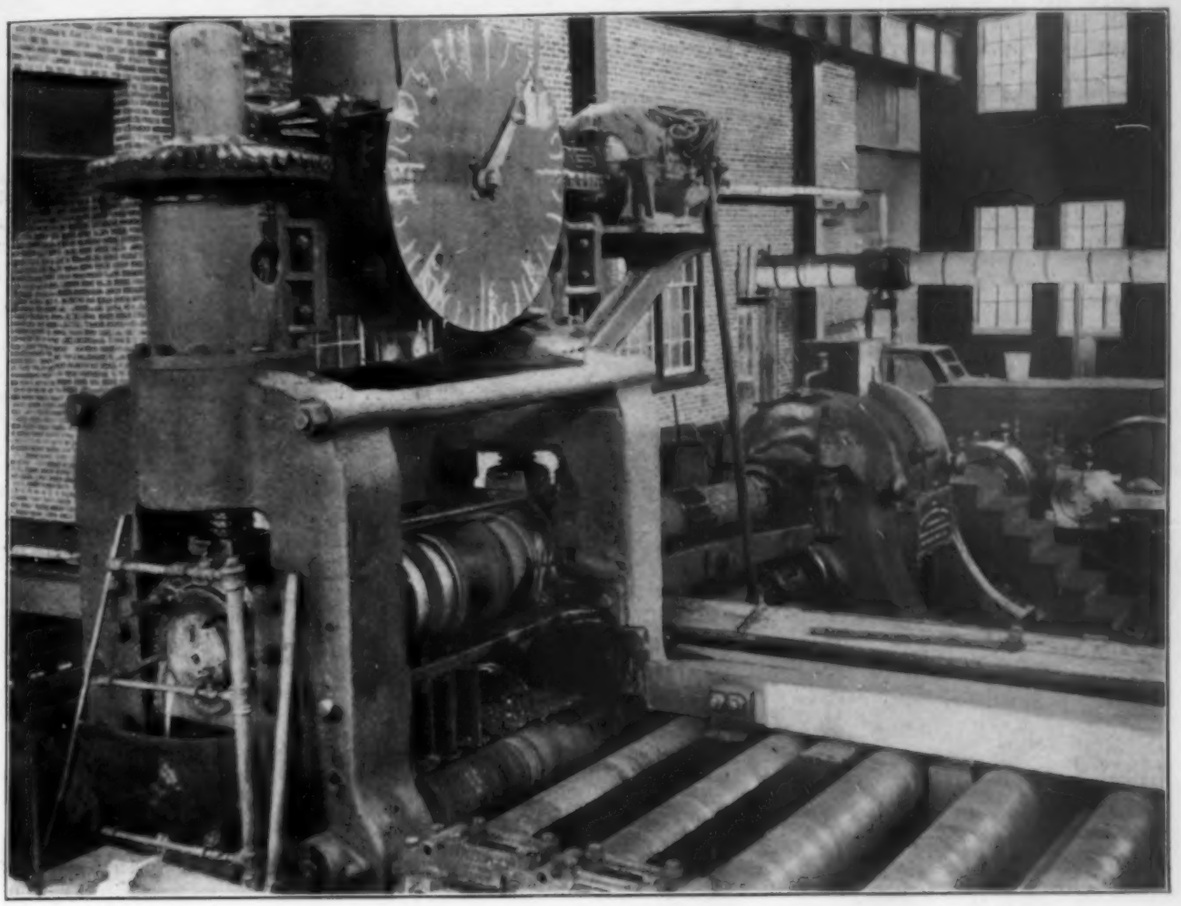


FIG. 3.—BLOOMING MILL.

Open-Hearth Furnaces and Blooming Mills.

The steel plant, which was built to furnish 1¼-inch square billets to the Morgan continuous rod mill, was designed by and built under the supervision of the Wellman-Seaver-Morgan Co., of Cleveland, who were also contractors for nearly all the machinery. The open-hearth plant consists of two 30-ton stationary furnaces, in a building 202 feet long by 53 feet wide, main span, with a lean-to 48 feet wide, extending the entire length. The furnaces are located in the lean-to and are served by a Wellman charging machine. The stock is elevated and delivered to the charging platform by an electric incline, which consists of a structural frame-work extending from the yard to the charging platform, carrying in a channel between the track-rails, an endless link chain fitted with projections which engage the car axles. This mechanism can reverse the motion of the chain and lower the empty cars back to the stock yard.

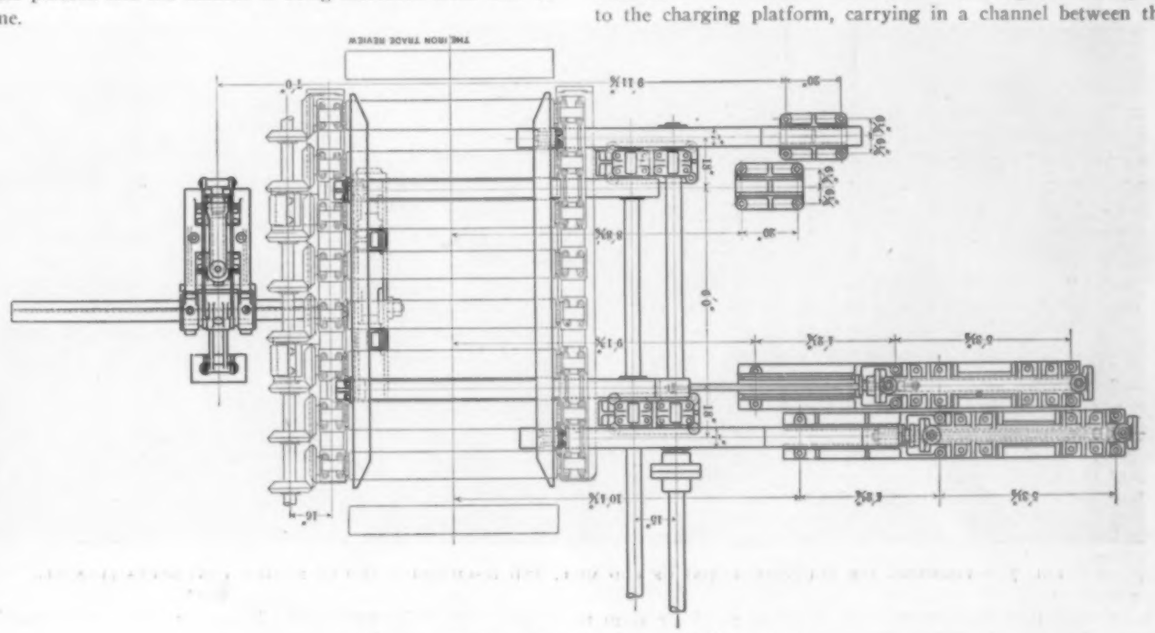


FIG. 4.—PLAN OF MANIPULATOR OF BLOOMING MILL.

Oil is used for fuel. It is brought from tidewater in cars

owned by the company, and delivered into two storage tanks of 50,000 gallons capacity each, located a safe distance from the plant. From these tanks the oil is pumped to the furnaces by two automatic pumps furnished by the Rockwell Engineering Co., of New York.

In the main span of the building the furnaces are served by a 45-ton electric ladle crane, equipped with a 5-ton auxiliary

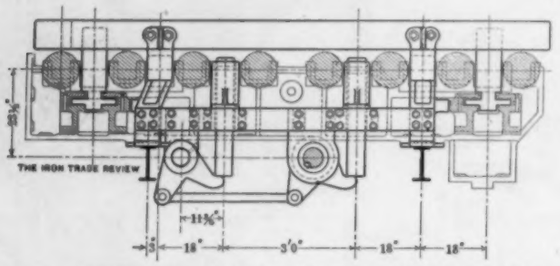


FIG. 5.—LONGITUDINAL SECTIONAL ELEVATION OF MANIPULATOR.

hoist. The steel is tapped from the ladles into molds standing on group plates on the general floor level. The ingots are stripped by means of the auxiliary trolley on the ladle crane and delivered to the upper end of the building, where they are served to an oil-fired continuous heating furnace by an electric crane. The ingots are pushed through the furnace on water cooled pipes, and when heated are pushed out of the furnace by hydraulic pushers. An electrically operated car receives the heated ingot and delivers it quickly to the blooming mill, where the hydraulic pusher sends it on to the roller tables.

The 25-inch reversing blooming mill was especially designed by the engineers to accomplish what has never been done in this country, namely, the rolling of 1¾-inch square billets direct from the ingots on the reversing mill. The results have been more than satisfactory, and 30 ingots per hour seem to be very easy work. The mill is designed to roll ingots of any size up to 12x14 inches. In addition to the regular size, 1¾ inch squares, larger billets and general shapes can also be made for the general market. The mill throughout is strong and embodies the latest features of blooming mill practice. The rolls are operated by an electric screw-down, and the mill tables are each driven by electric motors, the controller levers being connected together so that both tables are worked as one.

A feature of the equipment is a new type of manipulator, which acts both as a manipulator and as a movable guide. The ingots are handled quickly and without the assistance of labor and wrenches, as are used on the ordinary type of reversing mill. The side guards for both the front and back tables next to the housings are heavy slabs, which are moved across the tables by an arrangement of racks and pinions, operated by double acting hydraulic cylinders. The guides on both sides of the table work simultaneously and can be moved at will clear across the tables. This makes it possible to hold up and edge any thickness of slab in any of the passes, and the mechanism has strength enough to straighten the ingots of any section rolled on the mill. It is also possible to manipulate the ingot on either side of the mill.

On the front or roller side and below the roller level is a pair of fingers, attached to the inner side of the right hand moving guides, and carried by the latter in its mechanism across the table. A single acting hydraulic cylinder is connected to these fingers through a square shaft and lever arrangement, giving a quick upward movement to the fingers for turning the ingots as they lie between the guide slabs, which are only separated sufficiently to allow the piece to turn over. A small oval, many times the length of the slabs, is edged almost instantly without using the fingers. By quickly clamping it between the slabs, the piece is turned on edge, and a slight release of the slabs permits it to be carried by the table rollers into the roll pass.

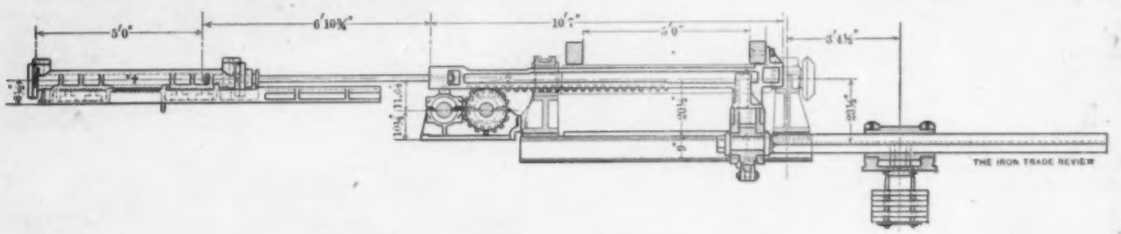


FIG. 6.—DETAIL OF MANIPULATOR, CROSS SECTIONAL VIEW.

The mill pinions are of steel with cut teeth enclosed in tight housings, of the J. R. George pinion housing type. The mill is driven by a 30x36-inch Wm. Tod Co. reversing engine, through cut gears, geared 1 to 1. Commanding the mill, pinions, engine, roll lathe and standard gauge track, is a 10-ton Niles electric overhead traveling crane. The rolled pieces are delivered from the mill on an electric driven roller table to a power shear built by the United Engineering & Foundry Co., cut into 30-foot lengths, and run on to a hot bed. When sufficiently cool, the billets are pushed by an electric pusher into a cradle, picked up in five-ton bundles and carried by an

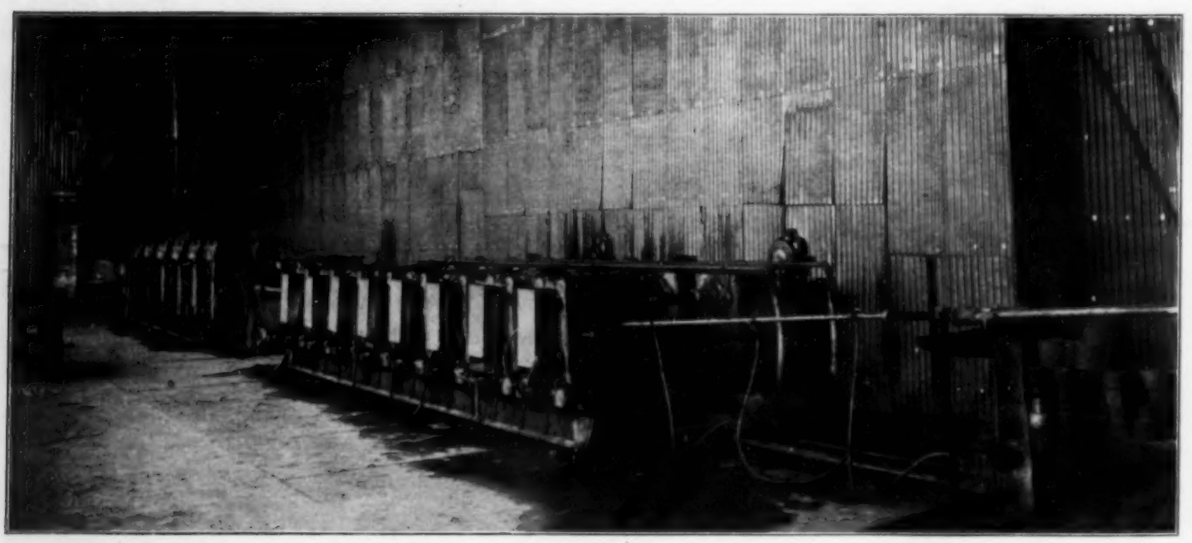


FIG. 7.—FINISHING AND ROUGHING TRAINS OF ROD MILL, AND DISCHARGING END OF MORGAN CONTINUOUS FURNACE.

electric crane to the railroad cars standing on a low grade shipping track, which passes through the building.

Adjoining the blooming mill building are the boiler and power houses. In the former have been installed six 264-h. p. horizontal water tube boilers built by the Aultman-Taylor Co. A feature of the boiler house is its width, which is sufficient for suitable coal storage and also a standard gauge railroad track, so that car-loads of coal are run into the building and unloaded under cover—a provision which is appreciated by those who have experienced the difficulty of unloading coal in

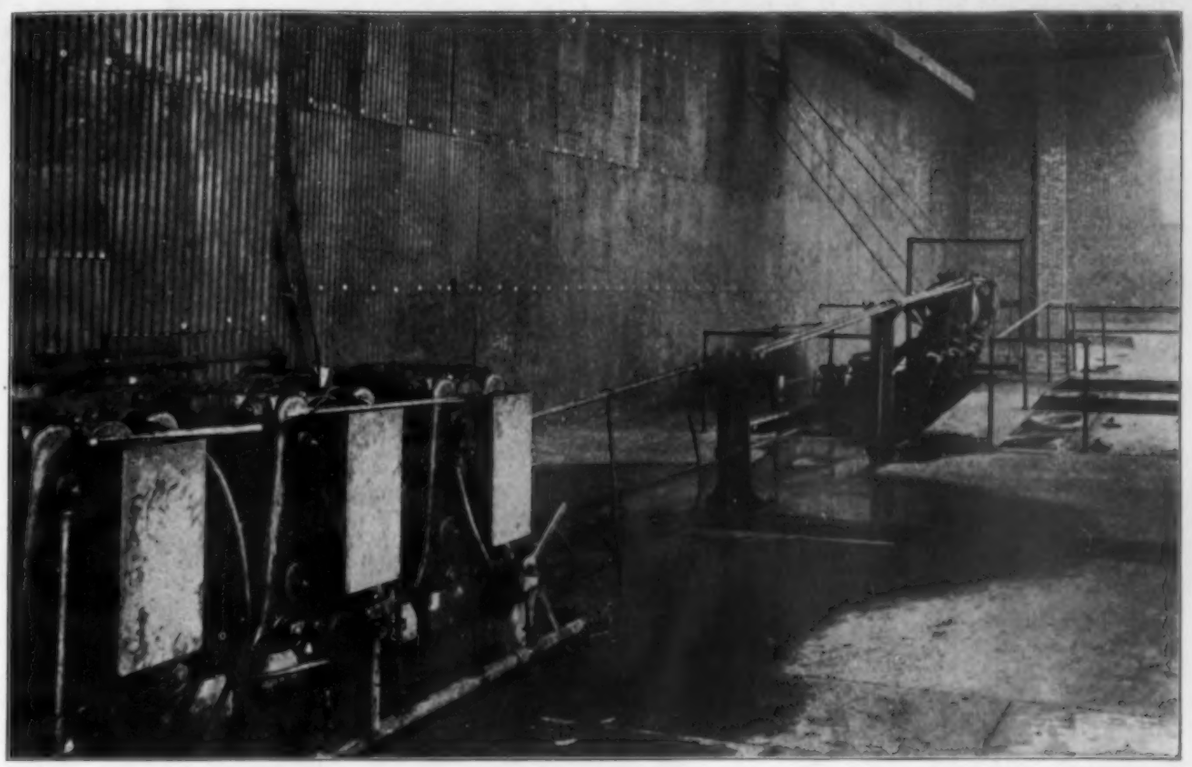


FIG. 8.—VIEW OF REELS IN ROD MILL AND OF CONVEYOR FOR ROD BUNDLES.

a severe climate. The power house contains at present one 200-k. w. Westinghouse generator, direct connected to a 385-h. p. Buckeye engine, space being reserved for a duplicate unit. The hydraulic power for the plant is furnished by two Wilson-Snyder pressure pumps and accumulator located in the blooming mill engine room.

The buildings in general have brick walls, and are of steel framework construction with corrugated iron roofs, furnished and erected by the Variety Iron Works Co., of Cleveland. All

FIG. 9.—OPEN-HEARTH FURNACE AND BLOOMING MILL BUILDINGS.

foundations for buildings and machinery are of Portland cement concrete.

Water for all purposes is obtained from drilled wells at the plant; the immense gravel deposit underlying the entire vicinity furnishing an inexhaustible supply. The stock yard is ample in size, and conveniently located. Owing to the necessity of preparing a large percentage of the country scrap for the charging boxes, and to avoid the heavy expense of handling all the material to the stationary scrap shear, as is usually done, a simple but unusual expedient was adopted of mounting an electrically driven shear, capable of cutting 2x2 inches, on a low truck, which is placed by the yard engine alongside the pile to be sheared. Power is applied through cables and plug connections to the mains, carried on the electric light poles. The location of the plant on the property permits of future extensions without altering the present admirable track system.

The Morgan Continuous Rod Mill.

The rod mill has been in operation for more than two years and was designed and built by the Morgan Construction Co., of Worcester, Mass. It is of the pure continuous type and is fitted up with perhaps a stricter regard to economy of operation than any rod mill in the United States. Although located immediately adjacent to the other works, it has its own boiler plant, water supply, pneumatic pressure, electric light and gas plant, all embraced in a building 75x220 feet, and a small annex for the gas producers. The rod mill building is a good example of modern mill construction, being built entirely of

FIG. 10.—ROD MILL BUILDING.

steel, brick and glass, and so designed as to give the maximum of comfort to the employes in the way of light, air and protection in cold weather.

The billets are received at one end of the building and the coiled bundles of wire rods delivered at the opposite end on trucks ready for the wire drawing department, no hand labor whatever being employed in the operation.

The billets are 30 feet long and weigh 300 pounds. They are mechanically taken from the stock pile and charged into the heating furnace endwise through a small opening at the cold

end of the furnace. The facility with which long billets can be stocked and manipulated by mechanical means is well exemplified. The heating furnace is of the Morgan continuous suspended roof type, having its discharge door located close to the first pair of rolls in the continuous mill. Each time a billet is charged at the cold end of the furnace, a hot billet is mechanically pushed into alignment with the pass in the rolls. A mechanical pusher discharges the billets into the bite of the first pair of rolls, which then draw the entire billet slowly out of the furnace.

The continuous mill has 14 pairs of 10-inch rolls, which reduce the billets to No. 5 wire rods. The disposition of the furnace, rolls and reels is such that 60 percent of the 300-pound billet is rolled and coiled on the reels before the last end leaves the furnace. The rod reels, which are of the improved Morgan automatic type, discharge the coils directly on to a long flat conveyer. The cooling conveyer passes out through the end of the building to a point near the cleaning house and convenient for shipping. An interesting point about the conveyer is that it is designed to discharge the coils of rods on edge on to the trucks instead of flatwise as is usually done. The advantage of arranging the coils in this manner on the trucks is that then they are in shape to be handled mechanically in the cleaning house and the 300-pound coils are handled with less labor than the usual 150-pound coils.

The gas plant consists of two 8-foot Morgan continuous producers, one of which is sufficient to supply all the gas required by the heating furnace. The mill is driven by a 23 and 46x48-inch condensing Corliss engine. Steam is supplied by three 250-h. p. B. & W. water tube boilers. A complete equipment is provided for the purification of feed water. The average output of the mill is 80 gross tons of No. 5 rods per 12 hours. Wickwire Bros. draw most all of their rods into fine wire and it has been their experience that continuous rolled rods are softer than those rolled on other mills, and therefore especially well adapted to their requirements.

Iron Ore in the State of Washington.

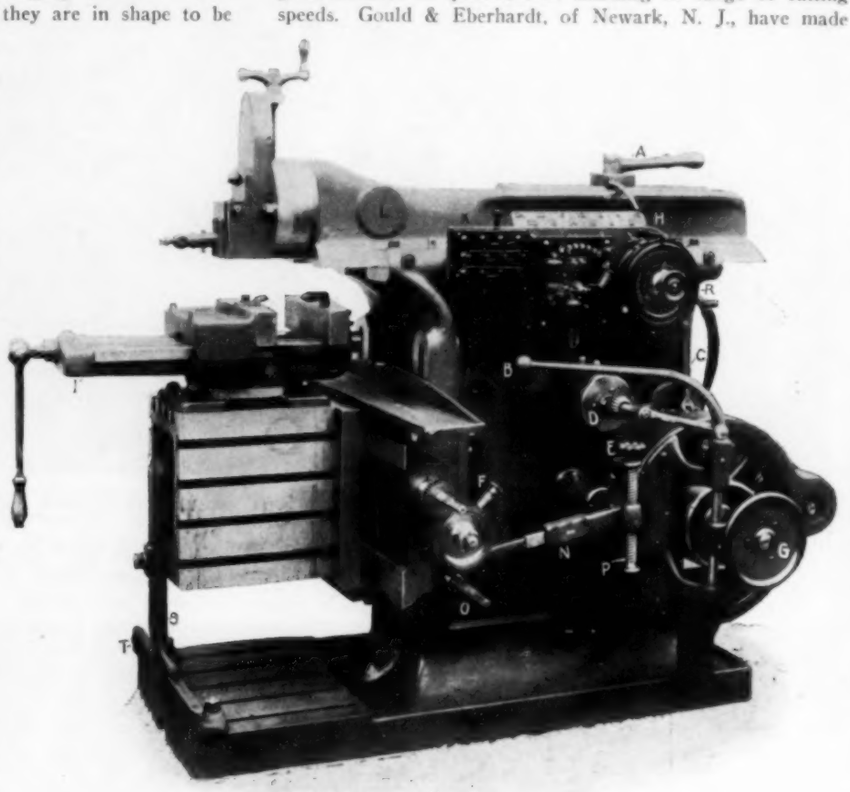
Iron ore, samples of which are found to contain 61 percent iron, 2.18 percent silica and 0.12 percent phosphorus, is reported in the Iron Hill property in Washington. The mine is 10 miles west of Valley Wash., on the S. F. & N. railway. It was acquired last summer by officials of the Great Northern railway. Louis W. Hill, son of President James J. Hill, has been in Spokane recently arranging for the continuation of the exploring work. Last summer when the property passed into the hands of the present owners, J. D. Farrell, chief western lieutenant of James J. Hill, was in charge of the negotiations. He announced the plan of the railway interests to be the erection of furnaces and mills to manufacture all kinds of iron and steel for Northwestern and Oriental use, provided the property showed ore at depth like that on the surface. The ore now being encountered is said to be richer than that found at the surface.

The Brownell Foundry Co., of Dayton, O., was reorganized last week, the following officers being elected: President, A. H. Kemper, Dayton, O.; first vice president, C. A. Hinch, of Cincinnati; second vice president, W. P. Smith, of Dayton. The secretary and treasurer is yet to be elected. The new directors are: Bradford Shinkle, C. A. Hinch, George V. Richards, S. E. Hillis, J. H. Gibson, Dr. J. M. Crawford, George Puchta, C. H. M. Atkins, Kenneth McClaren, W. B. Gephart and A. H. Kemper.

A MODERN "HIGH DUTY" SHAPER.

The "new machine shop practice," including the modern betterments of thorough factory organization, the use of the new "high duty" tool steels, and the accurate recording of successive similar operation time expenditures, is said in a certain instance to have reduced the per pound finishing labor costs as much as 30 percent, although the shop in which this very large gain was made was at the start a thoroughly well equipped establishment. A considerable proportion of this gain came from the introduction of the new steels for cutting tools, intelligently used in connection with improved speed changing devices appled to the machine tools themselves, whereby the workman was enabled to very quickly change the cutting speeds, and so secure the fullest possibilities from the great endurance of the high duty cutting steels.

The shaper has been allowed, by most builders of machine tools, to remain in nearly the same general form and possessed of the same metal-removing powers, for a long period of time, during which some improvements were made in the way of certainty of measurement in tool setting, but no very great advance in quickness of handling or range of cutting speeds. Gould & Eberhardt, of Newark, N. J., have made



A MODERN "HIGH DUTY" SHAPER.

a series of shaper improvements, involving almost every detail in tools of this class, and finally resulting in the perfected electric-motor-driven "double triple quick" stroke shaper shown in the accompanying illustration. It has great flexibility of drive, and a most convenient series of speed change producing devices. Gould & Eberhardt advocate individual motor application to machine tool driving, claiming that it has decided advantages over the grouping of several machines and driving them with one motor. As a strong argument in favor of their advocacy of the single motor drive, they cite their new shaper, the arrangement of which permits of the speed being instantly changed to suit the metal being worked, which would not be possible if the machine were one of a group, where any change in the speed of the motor would affect the speed of all of the machines in the group.

This new quick-change shaper combines its increased range of speeds with improvements in knee support, and has all of its operating handles brought in easy reach of the workman. It also makes automatic some important details, formerly requiring intelligent hand adjustment. These features have

much reduced the time needed to make speed and feed changes, so that the ram strokes can be varied from 100 to 5 per minute, involving rheostat and back gear adjustments through the full range, in about 10 seconds.

Beginning with the ram of the new shaper, the position-fixing nut works on a finely toothed washer and seat, which avoids slip, and is also provided with an index finger reading the ram stroke in inches on the full sized scale, H. This scale enables the operator to see instantly at what length of stroke he has set the machine. The power down feed to the head is attached on the pad L. The head turns through the full circle, and is graduated in degrees. The ram is heavy and long of V-section, stiffened with an internal lengthwise rib, and is confined by 45-degree angle surfaces, one side solid with the pillar casting, and the other side a screw-held and adjusted gibbed jaw. It has a long bearing in the frame when at the extreme forward stroke. The vise has a very large range, and is provided with extra jaws for tapers and rounds. The large base revolves through the full circle, graduated in degrees, and sets on a face plate held to the top of the knee with four bolts, set as far out as possible, thus giving all available support. The vise jaw shoes are applied at the outer ends, and the body of the vise has two T-slots on top so that odd work can be bolted down to the accurately planed vise bed, as well as held by the vise jaws. The vise is not dowelled to the base or knee, but is accurately set by the graduations. The part, I, of the vise body is a hard steel casting, made and set in the sand mold for the grey iron body, and welded thereto by "burning" on when the body is poured, thus providing a hard part of the body, which can be hammered without harm. This prevents inaccurate work from bruising of the scraped ways of the vise. Centers are fitted to the top of the vise jaws, thus making a very complete implement, having great range and stability.

The patented pillar extension is an added base member of substantial depth, reaching out in front, planed on top and T-slotted. To this extension base the knee support track T is bolted. This gives the knee the full outboard support of the base extension, and both increasing the knee stiffness, and very greatly reducing the wear on the cross rail dovetail, thus vastly improving the pillar and knee shaper design in the two weakest points. The knee rail is held to the frame of the machine by top and bottom clamp bolts on each side, and in addition has two permanently adjusted spring-washer bolts, one near the top on each side, which hold the rail close up to the pillar face, when the clamping bolts are released, and so prevent any chips or dirt dropping in between the vertical rail and pillar faces. The knee elevating screw is operated by the shaft, O, at the ring end of the cross rail, by the feed screw crank handle which fits both. The knee feed is by an eccentric groove in the side of the variable ram crank gear, which oscillates the outside double-end rocker fork, P, carrying a double-thread screw, having the hand feed adjusting knob E at the top end. The pawl rod N is jointed to the feed adjusting screw nut, and a scale on the side of P shows the number of ratchet teeth covered by the pawl movement. The pawl rod N automatically adjusts itself to the different lengths demanded by different cross rail heights, by means of two stop studs which limit the pawl arm travel each way, and by a screw-adjusted, leather-faced friction slip device formed in the body of the rod, N. The workman simply raises or lowers the knee-rail at will; the pawl rod length takes care of itself, lengthening or shortening in the friction slip as may be required. The friction is enough to drive the cross feed, but will yield if the knee is carelessly fed to the cross-rail limit without damage to anything. The feed pawl is of the lifting-and-turning variety, and has its round lifting head flattened on the driving direction side, so that the workman's fingers tell him how he has adjusted the pawl, without stopping to look at it. The pawl ratchet carries a spur gear, which drives the feed screw pinion, so that wide feeds may be had, and different gears and pinions are used to give fine or coarse down and cross feed, as may be required for tool room or workshop use. The very valuable and efficient knee support and the safe and most convenient pawl rod length adjustment are both covered by patents, which include a separate claim on the T-slotted front extension of the pillar base. The ram drive is by a slotted vertical lever with a sliding block and screw-adjusted crank wrist, secured by nut, D, which is both hand and wrench-tightened, so that the crank wrist shifting handle may be applied, and both hand and wrench nut tightening may be done without stopping the ram. The workman is thus enabled to vary both ram stroke and ram position without stopping anything, and hence with the least possible loss of time, and with absolute certainty by observing the index.

The electric driven shapers are made for both constant and variable speed motors. The constant speed motor requires a four-step cone on the armature shaft corresponding to the cone on the shaper, for obtaining the variations in speed, which, together with the back gears, give eight speeds. The illustration shows a variable speed motor with a rawhide pinion on the armature shaft, friction clutch, B, from spur gear to crank gear pinion shaft, which has a sliding back gear speed change, by the handle C. To make the back gear change, the pinion shaft is unclutched by a single movement of the clutch lever B, which has a brake attachment enabling the operator to stop the machine instantly, at any part of the stroke. The motor shown in the illustration is wound for any single voltage, direct current. Any make of motor for any voltage or current can be used to meet a customer's requirements.

In case of a constant speed motor being employed, with the four-step cone, making eight changes with the back gear, the well-known Eberhardt stroke and cone scale are applied, so that the workman is always informed as to the proper step on the cone, for a desired ram stroke. The belt-driven shaper cones are carried on stationary sleeves (patented), the sleeves taking the belt strains, thus relieving the pinion shaft of all save the actual gear driving load. This improvement has already appeared in these columns.

The variable speed motor is started by the knife-switch, K, and its speed is controlled by the rheostat knob, R, and by the back gear change obtained through the lever, C. All of the ram stroke variations, from 100 strokes per minute single geared, to five strokes back geared, can be made inside of 10 seconds' actual time, thus making it possible to economically vary the tool speed, to suit the best working conditions for performing short operations, as must be done to obtain the lowest possible labor costs of part-finishing with the new tool steels. The hand-wheel, G, on the outer end of the pinion shaft, gives a very convenient hand movement of the ram, either way, as may be desired by the workman in setting the tool. All shafts run in cylindrical bushes held in bored seats in the frame, and can be cheaply renewed without change of original alignment. The pillar is ribbed inside, and the whole machine has all the metal everywhere that can be used to advantage for solidity and stiffness.

Westinghouse Electric & Mfg. Co.'s Plans.

The Westinghouse Electric & Mfg. Co. is arranging to do more of its foundry work in Cleveland, where it now has a machine shop and two foundries. A new machine shop, 2,200 feet in length, is now building in East Pittsburg, and the equipment of the Cleveland shop will go to help fit up the East Pittsburg works. The Cleveland shop will then be converted into a large foundry, and two additional foundries will be built. Cleveland will thus become the location of all the foundry work, except that of the Allegheny foundry. More than a thousand men will be employed in Cleveland. The work will be so laid out that heaviest castings will be made in one shop, medium sizes in others and small work in another. Large pattern making shops will also be put up, and the site, on the lake front, will be occupied by buildings. The centralization of foundry work is expected to effect a saving despite the freight costs of moving the finished castings to Pittsburg.

Henry Johnson, foundry foreman of the Pratt & Whitney Co., Hartford, Ct., has tendered his resignation, to take effect May 1, and has accepted the position of assistant to Supt. Tyler, of the Westinghouse Co. Mr. Johnson will leave Hartford next Monday for East Pittsburg, where he will spend a month with Supt. Tyler, familiarizing himself with his new duties. About June 1, he will assume management of the company's Cleveland foundries.

A SPEED-CHANGING DEVICE.

There is a need in the operation of alternating apparatus, as when connecting a couple of generators in parallel, for a variation of the one prime mover or the other in the matter of speed. It is not necessary that the speed should be varied to any great extent, and in fact, as will be noted by the interesting article by Mr. Boehm on the speed of flywheels, recently published in *The Iron Trade Review*, but a limited interference with the rate of speed has a surprising effect on the safety of the machines. The limited amount of speed variation required for alternating current purposes, in order to bring the generators into step, ranges, however, from 5 to 10 revolutions only and this is amply taken into consideration in the design of the engines for such service. An appliance for this purpose, varying the speed of an engine within these narrow limits, is illustrated as applied to the governor of a Corliss engine, both engine and governor being the product of the Brown Corliss Engine Works of Corliss, Wis.

The device acts directly upon the ordinary regulator and after adjustment to the speed desired the attachment is locked in position without further attention from the engineer and the governor is free to operate in the usual manner. Fig. 1 shows a governor with the attachment for varying the speed and Fig. 2 is another view taken at right angles to Fig. 1. The operator handles the device entirely from the switchboard and is thus conveniently in touch with the other electrical devices located there. This is a matter of some importance which the electrical control of the speed variation renders thoroughly practicable. The motor A is started, stopped or reversed from the switchboard through suitable switches and the armature transmits its motion by means of a worm to a worm wheel. One end of a long spring (B. see Fig. 2) is attached to the worm wheel and the other end of the spring is fastened to a lever C (Fig. 1). This lever C is connected through the link D to a fork E. The fork E is coupled to a counterpoise F which of course moves up and down in the usual way.

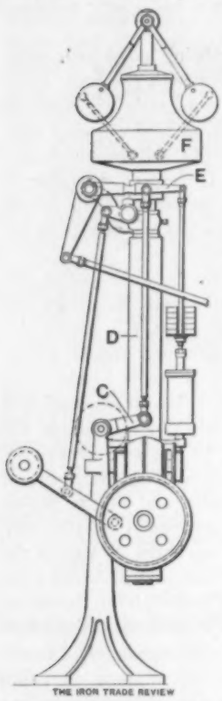


FIG. 1.—A SPEED-CHANGING DEVICE APPLIED TO A CORLISS ENGINE GOVERNOR.

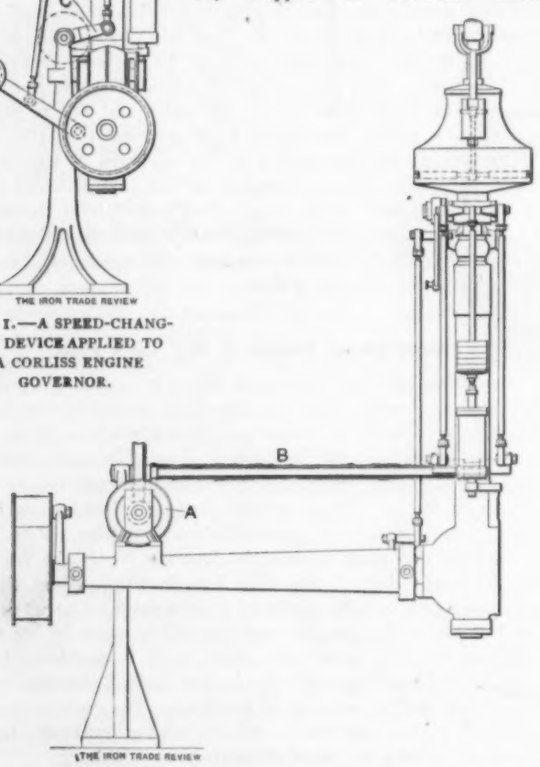


FIG. 2.—ANOTHER VIEW OF THE SPEED VARIATOR SHOWN IN FIG. 1.

The operation of the device may be briefly described as follows: The motor runs in either direction as required and either twists or untwists the spring B; the effect of this tension being practically the same as a weight being added or removed from the counterpoise and consequently the speed of the engine varies accordingly. When more tension is applied to the spring the engine runs faster and when the tension is taken off the spring the engine runs slower. Of course the long spring is an elastic connection between the worm wheel at one end and the lever C at the other and therefore the governor is free to act in the ordinary manner with the addition of the tension calling for the required change in speed.

Laclede Car Co. Sold.

The negotiations which have been in progress between the St. Louis Car Co. and the Laclede Car Co., St. Louis, came to a conclusion April 16, the result being an outright purchase by the former company of the entire plant of the latter. The Laclede plant, while the property of the St. Louis Car Co., will be run under its old name. The capital stock of the purchasing company is being increased $1,500,000, and it will soon have in its employ about 2,000 men. In the Laclede plant there will be employment for more than 500 men.

Abe Cook, secretary and treasurer of the Laclede Car Co., is to be retained as purchasing agent of the same company. James P. Kiely, president of the company, is to retire. The company was incorporated in 1883, and at the time of the sale was the oldest car manufacturing plant in St. Louis. E. I. Robinson, vice president and general manager of the Laclede Car Co., will occupy the same position under the new arrangement, and will be assisted by his son, E. T. Robinson.

Pressed Steel Car Co. Earnings.

The earnings of the Pressed Steel Car Co. for the year ending March 31 show an increase in surplus of over $45,000, compared with the corresponding period in 1902. The figures are as follows:

		Increase.
Net earnings	$1,069,330	$44,212
Fixed charges	48,191	*11,651
Net income	1,021,139	55,863
Prop. pfd. div.	218,750	.....
Balance	802,389	55,863
Deprec. reserve	77,500	10,493
Surplus	724,889	45,370

*Decrease

Attorney General Hamlin, representing the State of Illinois, has certified to State's Attorney Deneen of Cook County the names of 3,000 corporations which have failed to comply with the provisions of the Illinois Anti-Trust Act requiring an annual affidavit to the effect that they have not entered into any combination or trust. The Attorney General requests the State's Attorney to proceed according to the provisions of the Anti-Trust Act to enforce against each corporation the penalty provided by statute for the failure to make such report. This action results from a recent decision, noted in these columns, against the Butler Street Foundry & Iron Co., of Chicago. The penalty fixed by statute is $50 a day. As these corporations have been delinquent for five or six months they are liable to a fine of $8,000 to $10,000.

A cablegram from Berlin says that the late Herr Krupp's various works have been organized into a stock company with $40,000,000 capital under the designation of the Friederick Krupp Co. Former Public Works Minister Thielen is vice president of the board of directors. The manager is ex-Landrath Roetger. The stock, which is not listed on the boerse, remains in the hands of the Krupp family.

THE MESABI IRON-BEARING DISTRICT.

Volume XLIII of the Monographs of the United States Geological Survey is by Charles Kenneth Leith, and is issued under the title of "The Mesabi Iron-Bearing District of Minnesota." It is a splendid volume of 316 pages 9x12 inches, and is fully illustrated with maps, half-tone reproductions and colored plates. One of the noteworthy features of the work is an elaborate geological map of the Mesabi range, locating all the mines and mining towns and indicating the characteristic formation of the ore-enclosing rocks. It represents a prodigious task and was only made possible by the unusual facilities at the command of the survey. The letter of Prof. C. R. Van Hise, geologist in charge, transmitting the monograph refers to the three that preceded, these relating to the Penokee-Gogebic, Marquette and Crystal Falls districts. The fifth and sixth, which are soon to follow, relate to the Vermillion and Menominee districts. Prof. Van Hise announces that a closing monograph on the "Geology of the Lake Superior Region" will contain a general discussion of the geology of that region including a summary treatment of each of the iron-bearing districts.

Dr. Leith has completed no mean undertaking in the preparation of a work that should adequately represent the geology of the Mesabi district, and answer the questions which geologists, mineralogists, engineers and mining men have to ask about its history, formation, development and its extraordinary resources. The early chapters of the work deal exhaustively with the geography, topography and geology of the district, and the various rock series and their relation to the ore deposits. The ores are in basin-shaped deposits, with great variety and irregularity of shape, but the horizontal dimensions are usually great as compared with the vertical dimensions. Chapter 9 is of particular interest, dealing with the origin of the ores. They are shown to develop mainly from the alteration under surface conditions, of green ferrous silicate granules, which have been given the name greenalite. Their development is believed to be analogous to that of the iron carbonates of other parts of the Lake Superior region. In chapter 10 economic features of Mesabi range operations are treated—mining, transportation, production, reserve, ownership, prices, etc. In chapter 11 exploration for ore is discussed and an attempt is made to give the basis for locating explorations which the geologic structure and manner of development of the ore would seem to warrant.

Dr. Leith, like Prof. Van Hise and others who have produced the monographs relating to the older ranges, has placed the Lake Superior iron mining interests under obligations for his thorough and masterly treatment of the important subjects committed to him. Such a monograph on the greatest iron bearing district in the world will stand as a monument to the high talent now available for the splendid work of the United States Geological Survey.

Dr. Leith's summation of the similarity and difference between Mesabi ores and those of other Lake Superior ranges is appended as of special interest to our readers:

"The iron ore deposits of the Mesabi are similar to those of the other Lake Superior ranges, commonly known as the 'old ranges,' in the following features: 1. They are concentrates from an original ferrous iron compound. 2. They have been concentrated by surface waters bearing carbon dioxide and oxygen. 3. They are located where the circulation of waters has been most vigorous. 4. They are mainly in pitching basins, at the least in part bottomed by impervious strata.

"The Mesabi iron ore deposits differ from those of the old ranges in the following features: 1. The original material which by its alteration has given the iron ore in the Mesabi district, while a ferrous compound of iron, is mainly a silicate rather than a carbonate. 2. The pitching basins in the old ranges are formed by a folded impervious formation or by the intersection of the impervious formation with a dike, as in the Penokee-Gogebic district. The ore lies against the impervious wall rock at the bottom and also to a considerable extent at the sides. In the Mesabi district the ores, while largely confined to broad, gentle synclines, are in irregular bodies, occupying but a small part of the syncline, and the local attitude of the iron formation layers immediately adjacent to the ores may give no indication of a synclinal structure. 3. The Mesabi ore deposits are for the most part shallow and have great horizontal dimensions, while those of the old ranges are deep and narrow. The Mesabi deposits are seldom deeper than 300 feet, and may have a considerably greater horizontal extent—in some cases more than a mile. Deposits of the old ranges may reach a depth of 2,000 feet or more, and seldom have a surface extent greater than a few hundred feet. On the Mesabi range the areal extent of the ore deposits is about 5 percent of the entire iron formation, while in the old ranges the percentage is less. 4. The pitch of the deposits is uniformly less steep in the Mesabi range than in the old ranges. Average pitches range from 10° to 20°. 5. The Mesabi ores are much more hydrated than the ores of the old ranges, with the possible exception of those of the Gogebic range, and they are on an average of a softer character. The silica content also averages less."

The New Pedrick & Ayer Co. Shop.

The Pedrick & Ayer Co. is one of many concerns forced by the growth of business in the last few years to seek more commodious quarters. For several years this company occupied its own shops in Philadelphia, extending its line of air tools, while continuing its older line of special railroad tools and appliances. A site for the new works was purchased immediately adjoining the Clinton Ave. Station of the Central Railroad of New Jersey at Plainfield, N. J. No expense has been spared in the construction and equipment of the buildings which are all of brick and steel of slow-burning construction. Good light has been especially sought, and convenience to transportation facilities has been carefully considered. The plant consists of a main shop 100x400 feet, boiler house 40x40 feet, engine house 40x40 feet, immediately adjoining the boiler house, blacksmith shop 40x50 feet, pattern and storage shop 45x100 feet. There are in addition the usual storage bins and small outbuildings.

The main building contains the offices of the company, draughting room, tool room and storage of raw materials and finished parts. The principal portion, however, is devoted to the machine shop proper, the fitting, assembling, testing and shipping departments. The main bay is provided with a 15-ton Shaw electric crane equipped with three motors. Besides the main traveling crane there are numerous hoists and jib cranes actuated by compressed air. The machine tools are all driven by electric motors, the prevailing plan being to group several machine tools on one countershaft, this in turn being belted to a motor of fair size and efficiency. In the testing department proper arrangements are made to provide practical working conditions for the air compressors, portable and stationary riveters, hoists and cranes, which are produced in great variety and size. At the lower end of the main building a spur from the railroad extends three car lengths under the crane where rapid loading and unloading of machines and products is possible.

The boiler and engine house, with fire wall and metal door between, may be considered as one building. The boiler room is well equipped with all necessary appliances and has substantial storage capacity for coal. The engine room contains a belted automatic air compressor of the type largely sold by the company and two direct-connected dynamo-engine sets for supplying power and light to the entire works. The sets are 150-k. w. capacity each; the engines furnished by the Ames Iron Works, and dynamos and switchboards by the General Electric Co. The blacksmith shop and pattern shop and storage house are well provided with the accessories required for up-to-date work. In its completeness and the character of its equipment, as well as in its look toward future extensions and improvements, the entire plant reflects great credit upon its operators.

In the new machine shop of the Wm. Tod Co., Youngstown, O., the first vertical blowing engine built in this shop is nearing completion, being the seventh of an order for eight engines for the Colorado Fuel & Iron Co., Pueblo, Col. These have steam cylinders 48 and 90x80 inches and air cylinders 90x60. Among other large work on hand are three 40x60 twin cylinder reversing engines, with bed plates weighing 90 tons each, for the Lackawanna Steel Co., Buffalo, N. Y., and a pair of reversing engines, one for a Republic Iron & Steel Co. Youngstown plant. Among the large tools in the new shop are a 14-ft. Pond planer, a 24-ft. Niles vertical boring mill and a 20-ft. horizontal boring mill with 10-ft. spindle.

SHEPARD PNEUMATIC MOTOR HOIST.

Compressed air as a motive power for hoisting is now so widely used, and may fulfill requirements so well, particularly for handling light and medium loads, that a review of some

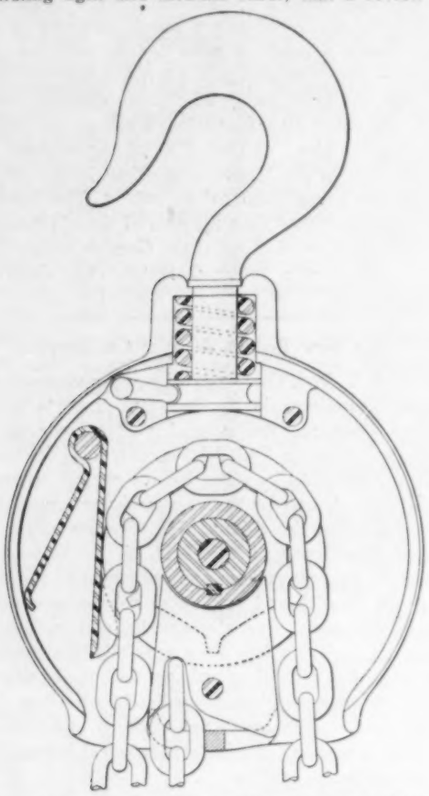


FIG. 1.—SECTIONAL ELEVATION SHOWING SPRING CHAIN-GUARD AND GOVERNOR SPRING ON HOOK.

of the conditions of use will be of interest. The pneumatic motor hoist has reached no general form common to all makers, but is found in nearly as many designs as there are individual builders. In the present article consideration is given to the Shepard type of pneumatic hoist, manufactured by the General Pneumatic Tool Co., of Montour Falls, N. Y. The small pneumatic motor is not of itself very efficient. It was early recognized that the compactness, simplicity, lightness, and ease with which it could be installed, would give the pneumatic motor hoist a decided advantage over any other hoisting apparatus of its class, provided in other vital characteristics it could be made satisfactory. It is practically the only form of power hoist which can be suspended by a single hook and occupy a sufficiently small head room to permit its use in all places where the hand chain hoist was formerly employed.

One of the first problems met in designing the Shepard hoist was the selection of a suitable type of gearing, to reduce the speed of the motor and to intensify its power sufficiently to enable it to handle the maximum load. The choice of a gearing of the worm or differential type would have eliminated all problems, such as sustaining the load and its smooth and safe descent. Unfortunately, however, any type of gearing which will retain the load without a brake, will be inefficient. Lowering a given load liberates exactly the same amount of power as was absorbed by it while being hoisted. The hoisting mechanism would reverse and permit the load to run down, unless the measure of its friction is equal to or in excess of the power stored in the object lifted. If the measure of its frictional loss equals or exceeds that of the useful work done, its efficiency will not exceed 50 percent and will probably be much less. The conversion of the motive power of the steam plant to actual hoisting, by whatever means, is accomplished only by several transformations. The careful engineer will at least look with regret upon a loss of as much as 50 or 60 percent in a single one of the transformations necessary. As a matter of fact an efficiency of 40 percent is all that may be reasonably looked for in the best worm or differential types of hoisting apparatus, and in any but the very best of its class it will be even less. If the hoisting mechanism is made up of a train of spur gearing of efficient design, an entirely new set of conditions is introduced. When power is shut off from the motor, an instant application of a brake is necessary to retain the load, and this must be partly continued while the load is being lowered, or else the motor must be capable of absorbing nearly as much power when it is running backward as it gave out in the act of hoisting. In the latter case, complete release of the brake is practicable and preferable. The substitution of spur gearing offers a perfect solution of the problem so far as securing high efficiency is concerned. The loss of power with spur gearing need never exceed 25 percent, and may be reduced to 20 percent or less. Combined with a high speed pneumatic motor it corrects the only remaining difficulty, that of sustaining the load safely and controlling it during descent. Unlike the electric motor, the pneumatic motor is capable not only of developing power, but in equal measure of absorbing power; it may, therefore, propel the gearing while hoisting the load, or restrain the gearing while lowering the load. Its ability to fulfill the latter function, and thus avoid the complicated apparatus which would otherwise become necessary, gives it an advantage which far outweighs its small lack of efficiency. A high speed pneumatic motor was chosen, therefore, because of the ease and certainty with which the load could be sustained by a brake applied directly to the motor shaft. The high speed of the motor insures a high ratio of gearing between the lifting sprocket or drum and the motor, and sustains the load with a very light application of the brake. Hence with a brake of moderate power, a large margin of safety is obtained. High speed in the motor, and consequently a high ratio between the motor and load hook for hoisting apparatus, affords relatively the same advantage as the high ratio between the dial and measuring points of the micrometer.

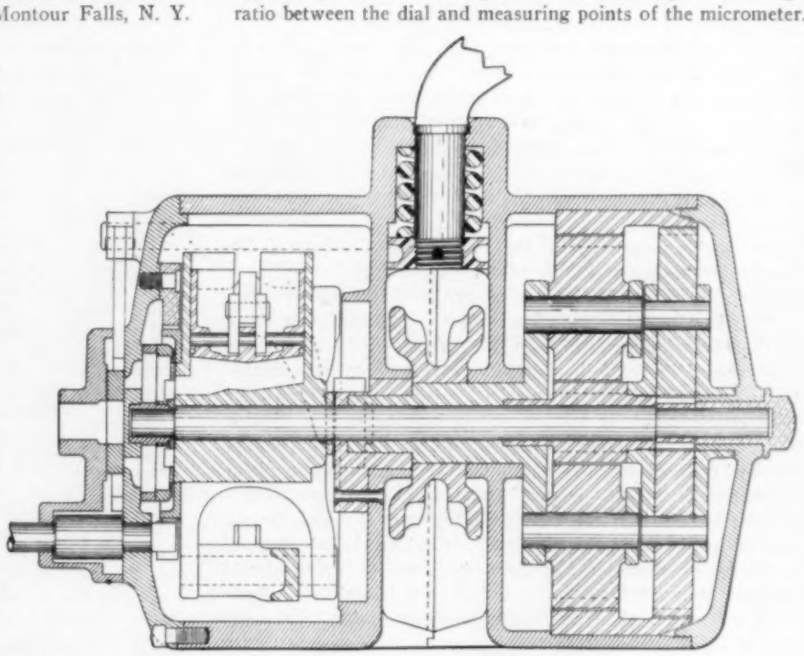


FIG. 2.—SECTION THROUGH MOTOR, VALVE AND GEARING.

In either case an easily controlled movement of the one part affects the greatest nicety needed for the other part. With a pneumatic motor, during the process of lowering the load, even with the supply hose disconnected, and the brake entirely in-

operative, if the throttle is released, both the supply and exhaust parts will be closed, and a vacuum will be created during one stroke of the piston, and compression during the other stroke. The intensity of both the vacuum and compression will increase until the load is arrested. In practice two or three turns of the motor only will be necessary to bring the load to rest. Absolute safety is thus offered against accident, even with the most careless operative. The throttle and brake operate in conjunction; the brake automatically grips the motor, when pressure is cut off, and at the same time the exhaust and inlet ports are closed. Either condition would hold the load suspended.

The motor used is of the piston type of simple design, consisting of three single acting cylinders radially mounted upon a hub on the driving shaft. Each cylinder carries a bell crank, to one end of which is attached the piston, to the other end a roller suited to revolve about a stationary eccentric. Air pressure acting upon the pistons successively pushes them outward, causing the rollers to bear forcibly upon the eccentric, just at the time they pass its highest point. As the rollers under the load roll down the incline formed by the eccentric they propel the cylinders forward in their circular path. Air pressure is admitted and exhausted from the cylinders as the parts in the hub rotate alternately past the supply and exhaust openings in the cover plate of the hoist shell. Self adjusting metallic packings are used in the pistons and on the face of the hub, which keep the parts perfectly air tight. The bearings are not subject to reversal of stress, hence they do not need adjustment, and are durable and quiet running. Centrifugal stresses, which have been an objectionable feature in motors of this type, are nearly balanced between the piston at one extremity of the bell crank, and its heavy arm and the roller at the other extremity. The fast running bearings are, therefore, practically without load other than that due to the air pressure. Inertia and momentum strains are nearly eliminated, since every moving part of the motor traverses a truly circular path. It runs, therefore, with minimum vibration, and adapts the hoist for exacting service.

In foundry practice, for instance, the absence of vibration, either in the motor or gearing, is found to be of great advantage. When desired, the hoist is provided with a governor valve which is controlled by the load hook, and which will supply at all times exactly the amount of air required to handle

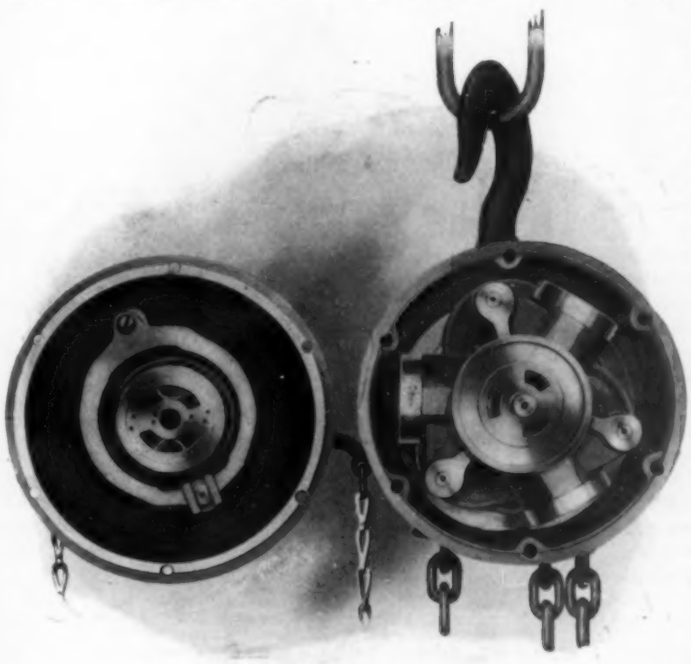


FIG. 3.—MOTOR AND SHELL.

the load, resulting in a decided economy in air consumption. The spur gearing used between the motor and lifting sprocket or cable drum, is compactly arranged in two separate trains; it is enclosed within the hoist shell, and runs in a bath of oil, under the most favorable conditions for efficiency and durability. The motor is also fully enclosed, and runs in a bath of oil; copious lubrication of every running part is thus assured and attendance is reduced to an occasional replenishing of the

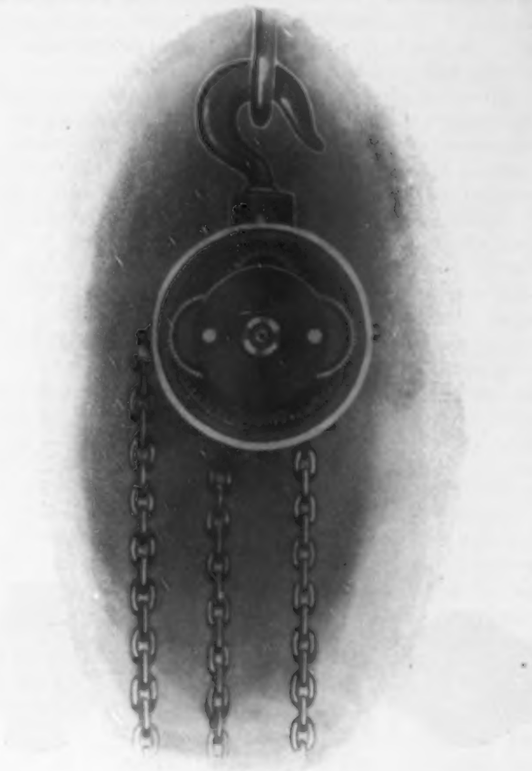


FIG. 4.—END VIEW OF THE GEARING.

supply of oil. No oil is ever fed to the motor with the air supply, hence none is ejected from the exhaust opening, and the supply in the motor case is only very gradually consumed. Nearly all the troubles attending the use of the air motor have probably resulted from the difficulty of securing proper lubrication. Injury follows very quickly from want of oil for either internal or external wearing surfaces. A method by which all wearing surfaces are constantly bathed with oil, without giving the lubricant direct access to the interior of the motor, where it may be carried to the exhaust opening and thus wasted, should effectually prevent injury to the wearing surfaces, and promote as long a life as in any other form of motor. This in connection with the effective methods used for packing every part subject to pressure, enables it to preserve a high efficiency.

The Shepard hoists are made in two types—those using a chain running in a sprocket wheel, and those using a wire cable winding upon a drum. The advantage of the chain type is the ease with which an auxiliary high speed hoist may be provided by attaching a hook to the free end of the chain. The main load hook is then attached to a lower block carried by two strands of the lifting chain, and is used for loads approaching the maximum which the hoist will handle, while the hook attached directly to the free end of the chain and running at double the speed of the block, is used for light loads up to half the capacity of the hoist. In all cases where the sprocket and chain are used, a spring chain guard is provided which effectually prevents the chain from climbing the sprockets, or any jar to the load from movement of the chain in the sprocket; because each link of the chain is firmly seated by the spring guard before it is subjected to any load.

In the illustrations, Fig. 1 shows a transverse sectional elevation, through the lifting sprocket and hook by which the

hoist is suspended, showing the spring chain guard and governor spring upon the stem of the hook. Fig. 2 is a sectional elevation longitudinally through the entire hoist, showing the motor and its controlling and reversing valve at the left, the lifting sprocket at the center, and the hoisting gearing at the

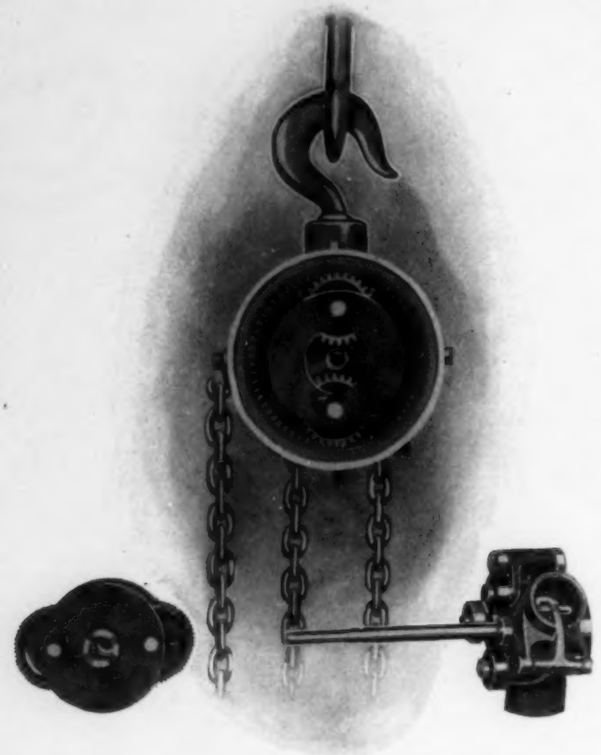


FIG. 5.—GEARING REMOVED FROM SHELL AND SHOWN AT LEFT. THE MOTOR IS SEEN AT RIGHT OF THE ILLUSTRATION.

right. Fig. 3 is from a photograph of the motor in position in the hoist shell, and Fig. 4 shows the gearing in position in another compartment of the hoist shell. In Fig. 5 the component parts are seen removed from the shell. Attention is called to the fact that removal and replacement of all of the working parts in either the motor or gearing compartments is practicable without in the least disturbing the adjustment, hence inspection, repair, or renewal of any worn member is possible with the least trouble or delay. Fig. 6 illustrates the hoist as seen under working conditions, and shows to advantage the compactness and symmetry of form.

Work on the construction of the plant of the Locomotive & Machine Co., of Montreal, Can., is progressing satisfactorily, and it is believed that by mid-summer completely finished locomotives will be turned out at the rate of two a week. It will require about 1,500 tons of structural steel to complete the shops now in process of erection. The first building erected was a structural shop, 210x80 feet, and the machinery is now being installed in it. It is stated that a considerable part of the machinery had to be secured in Germany, as the price and expedition in delivery guaranteed was such that United States manufacturers could not compete. A number of important orders were, however, placed in the States. The forging and erecting shop will be 340x66 feet; the boiler shop, 380x66 feet; the foundry, 180x66 feet; the power house, 100x80 feet; the pattern shop, 100x66 feet.

Miss Carrie F. Jones is now manager of the Preble Machine Works, Chicago. Two years ago her father, who was owner and manager of the works, died. Miss Jones persuaded her mother not to sell the works but to place it temporarily in the hands of an administrator and to permit her to study to carry on the business. The young lady went to a technical school and has now returned and assumed the position of manager of the works.

THE HANGING ROCK REGION.

IRONTON, O., April 27.—The Hecla Charcoal Iron Co.'s furnace at Hecla, this county, will be out of blast until June 1, getting a supply of stock ahead.

During the past week there has been a general exodus of iron workers from this city, owing to the suspension of the Republic Iron & Steel Co. puddling and bar mills, and the temporary closing down of the wire and wire nail mills of the Belfont Iron Works Co. and the Kelly Nail & Iron Co., due to the shortage of stock caused by the strike at the Ashland steel and rod mills.

The Ironton Engine Co. has received an order for an engine to go into the laboratory of the United States Bureau of Standards at Washington. The order was secured as the result of a test made by the Treasury Department on engines which go to San Francisco, and which established a new record in steam economy. The company will not be prepared to ship its products till fall, as its new plant will not be completed before that time.

The Portsmouth Steel Co. has ordered a small locomotive from the Baldwin works, for use on its tram road, and is also making 35 scrap carriages. The new charger will be completed May 1. A new electric crane and an ingot stripper will also be installed and a re-rolling plant, the furnaces for which would cost about $25,000, is contemplated later in the year.

Industrially speaking, Ashland, Ky., is dead for the time being, as a result of the strike. Both the steel plant and the rod mill are idle and there seems no present indication of a settlement of the labor troubles. The officials of the sheet mill decline to treat with the men as an organization, yet avow their willingness to pay the scale wages.

The Star furnace at Jackson has again blown in after an suspension for 24 days for relining.

A Pittsburg syndicate has options on 15,000 acres of clay lands in Greenup county, Ky., just below this city and contemplates the erection of a firebrick plant with a capacity of 50,000 brick a day. Several hundred men will be employed.

A petition has been filed in the district court at Richmond, Va., asking that the Trigg Ship Building Co. be adjudged a

FIG. 6.—THE HOIST UNDER WORKING CONDITIONS.

bankrupt. The total indebtedness is stated in the petition to be $1,250,000. The company has been in the hands of a receiver several months.

HOURS OF LABOR IN MACHINE SHOPS.

One of the papers presented at the Buffalo convention of the National Metal Trades Association on April 2 was that read by Geo. T. Bliss, secretary of the Erie City Iron Works of Erie, Pa., on "Hours of Labor." Mr. Bliss explained that Thos. E. Durban, general manager of the Erie City Iron Works, was responsible for the paper. Being absent from home, he had sent notes of its substance, which had been arranged and put in shape by the speaker. We make the following extracts:

This association, without a moment's hesitation, should take a most determined and unqualified stand against any reduction in the hours of labor. Fortunes great and small represent accumulated wealth. Great fortunes are an absolute necessity to the advancement and development of this country. Accumulated wealth seeking profitable investment is the one great element of our success as a manufacturing country. It builds factories and railroads, opens mines, rears towns and villages, builds street railroads, light plants and water works, boulevards and parks. The accumulation of wealth enables us to maintain our magnificent public school system and innumerable other public institutions which make our country great—the accepted country of the world. Without such wealth, we could not raise enough money to support one-tenth part of our school system and other public institutions we now have.

We all have, in our minds or can recall instances of the progress of new towns, shabby creatures at first, mudholes instead of pavements, no street lights at all, the town pump for a waterworks system, no public schools, no sewers. But time moves on. This town gets a railroad; a manufacturing plant employing a few hands; perhaps some unemployed capital seeks investment and profit, and drills wells for gas or oil and finds them, or prospects for coal and finds it. The town moves on. How? By accumulated wealth developing some of the resources which attract people to it. The town grows. The town pump or private wells are no longer adequate for water supply. Accumulated wealth that has built up factories and stores demands for protection a water plant. How is the money to be obtained? The town has grown and prospered and accumulated some wealth. Bonds are sold and more accumulated wealth seeking investment is employed to the mutual good of the community. And now our town is given a place on the map and continues to improve just in the ratio that it produces and accumulates and attracts to itself wealth seeking investment.

If we seek to limit the production, to limit the accumulation of wealth, how can the town improve? How can its resources be developed? If we limit the accumulation of wealth, how, I ask you, can you and I and all of our citizens in all walks of life, from the day laborer up, improve our condition?

The shortening of the workday to nine hours must limit our production and necessarily limit our consumption, as things that are not produced cannot be consumed. Limited production must necessarily limit the accumulation of wealth of our country. All wealth is the product of the toil of man, and if man toils less the accumulation of wealth is decreased accordingly. If we limit or decrease the accumulation of wealth, how are we to continue to develop the resources of our country? Limiting the production is a retrograde movement—a step backward.

If we are all hungry and want bread, if we are all naked and want clothes, if we are all poor and want wealth, how can we better serve our purpose, how can we better serve each other, than to produce all we can of all the things we all want? Surely, limiting the amount of necessities and even luxuries we all want cannot help each to get his portion.

What manufacturer is there here, who, in the time of demand like this now existing, would deliberately limit his production? Is there here a man who has not increased his investment to increase his production; who has not studied the problem over and over again as to how he could keep up with his orders, and hold his trade? Is there a man here who has gone on nine hours who has not done it in order to escape the consequences of a strike, and who has figured out that he could not afford to have the strike and would rather give up 10 percent of his production than to have it all stopped for an indefinite time?

Whence comes this cry for nine hours? Who is it would demand that we cease to accumulate, to progress, to become great, to add to the wealth of our nation? What have these persons or these labor organizations originated? What have they done that they should make such a radical demand? Has labor unionism ever stood for the improvement and uplifting of mankind? Has it been the exponent of the greatest good for the greatest number? Has it ever cared for the poor and friendless? Has it helped you and me to increase our output? Has it helped all who wished to become able and proficient craftsmen to do so? Has it ever stimulated its own members to do their best? No; it has done none of these things. It is endeavoring to enslave all mankind. It now tells its members when and under what condition they can seek to provide for themselves and their families, and it says to those who have not as yet accepted its yoke: You cannot work; you cannot live. You have been created by the Almighty, but we ordain that you shall not use the faculties He has given you, unless we direct your effort. It comes now to us and demands that we conduct our business as it ordains. It comes first in one garb and again in another. It comes with a torch and dynamite; with the decree that you shall not run your business except with its members. It comes with the threat of boycott, and anon it poses under the guise of humanity.

That the hour question is fundamental and underlies the entire social and economical system of our country cannot be doubted. More than 50 percent of members of union organizations are coerced into them. This movement is avowedly for the purpose of limiting production. Ten hours have been the correct hours of labor for years, and it is not too long, and in the trades represented here it is not too much. The question of shorter hours would have been raised long ago if the longer day were detrimental to life and health. The most of our shops are very sanitary and light; the work in any of them is not nearly as hard as it was five or ten years ago. All heavy work is lifted now by cranes, and any lifting or hard manual work done in the shop is done by helpers, and yet this movement was not started by them. Are we less humane than our predecessors? Not so. Every shop is better equipped than they were a few years ago, and the work much lighter. There is absolutely no ground for the humanitarian cry. Are we as a class more long-lived or more healthy than our fathers who worked 14 to 16 hours a day? Are we better citizens than they? Are crimes less now than then? Are family ties stronger? Do parents love their children more, or children respect their parents more? Is home life more beautiful under our 10 hours than under their 14 to 16 hours? I think not.

I do not wish to be considered as advocating longer hours than now exist. But we now have the 10-hour day established. All our investments are made, all our factories built on that basis, and it would simply be suicidal to change, and would most certainly affect our trade disastrously.

Many here are running 54 hours per week and would unquestionably be well pleased to have all their competitors put on the same basis. Not that they feel that 60 hours is too much, but they have been too weak to declare and stand for the rights they would like to have others give up. If this association should declare for nine hours, it would be putting the necks of all of its members in the union hangman's noose. Millions of dollars have been expended in the machine shops of this country to increase production from 5 percent to 20 percent, and it is simply appalling to think that we should even give this question of reducing the output again a second thought, especially when we consider the source from which the demand comes. Have the non-union workmen no voice in the matter? Are non-union men more rugged and healthy than members of the union? Do they love their families less? Gentlemen, we give unionists too much honor in discussing the question. Throughout the length and breadth of this land there has been too much, far too much conciliation and so-called arbitration. Arbitration now means, how much will the employer give up and get nothing? Let us not give up 10 percent of our production.

Let us insist that at least 10 hours shall constitute a day's work, and go even further and allow no overtime for work done between the hours of 6 a. m. and 6 p. m. on regular working days. Under no circumstances should any more fundamental points be yielded to organized labor.

Let us not hasten the time when we shall all be slaves. Let us not hasten the coming of an event like the French Commune, as I firmly believe that unless this labor union movement is brought under control, nothing can save us from civil war.

The Roe Mechanical Puddler.

In *The Iron Trade Review* of August 28, 1902, a description was given of the Roe mechanical puddler as described by the patentee in a paper before the American Institute of Mining Engineers. In his contribution to the discussion on the paper, just published in the Transactions of the Institute, Joseph Hartshorne, of Pottstown, Pa., writes as follows:

"Those of us who remember the history of the past efforts in this line, such as the rotary puddlers, in which also some of us had a part, can easily appreciate the problems involved, and may well be skeptical as to the outcome. Such, at least, was my frame of mind when the process first came under my notice. Now, after having seen every heat but three of the many made, it really seems to me that a process and plant for the mechanical puddling of iron has at last been developed which is practical, economical, and successful. Of course, I do not mean by this that either the process or the machines are developed to their highest point, technically or economically; but that, in my opinion, these goals are in plain view, and that the difficulties which remain are such as will be overcome by developing the skill of the operator through practice; making a few changes in the puddler, indicated by experience; and by giving greater freedom of escape for the slag pressed out by the puddler. These latter changes have been begun.

"It is not necessary for me to point out the many advantages which will accrue from this process, besides the cheapening of the puddling operation. They are, I think, sufficiently obvious from the facts that one skilled puddler can produce 4,000 pounds of puddled iron every 30 to 45 minutes, or, say, 60,000 pounds in 12 hours; this iron is in the form of a bloom which is practically homogenous, is free from laminations, and in a state very similar to that of the slab rolled from a steel ingot; and, finally, that this slab can be rolled or forged into finished product at a loss which will be about 6 percent from the pig."

Cornelius Shields, president of the Consolidated Lake Superior Co., announces that within 90 days the mills at Sault Ste. Marie will be turning out steel rails in sufficient quantity to meet all the demands of Canada. He adds: "Last year 130,000 tons were required in Canada, and when the mill at the Soo is in position in June, the output will be 150,000 a year. The duty of $7 a ton will be equal to 25 percent, as against foreign rails, and 16⅔ percent against rails manufactured in England, owing to the existence of the preferential tariff. Any surplus that might exist would likely be sold in the mother country, as steel rails will now derive the benefit of the preference. The government will likely give more ample protection to other kinds of steel in the near future, the announcement regarding the reconsideration of the binder twine question evidently meaning that the government would hand down a supplementary budget in regard to new lines. We are entirely satisfied with the provision that has been made."

The rolling mill plants of the Republic Iron & Steel Co., at Terre Haute, Ind., were closed a few days ago. This action was followed by the publication in Indiana newspapers of rumors that the plants had been permanently closed and also that the American Car & Foundry Co. would take one of the mills and operate it in connection with its car works. We are officially informed that the mills are merely closed for the present, that the company has no idea of removing the machinery from either plant, and that there is no truth whatever in the report concerning the American Car & Foundry Co.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review* and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

John McDonough and John Macmillan, Denver, Col., are organizing a company to manufacture boilers. Articles of incorporation are to be filed under the laws of West Virginia, and the capitalization is placed at $100,000, of which $25,000 is now in the treasury and available at once. The officers of the company will be George E. Ross-Lewin, president; H. A. McIntyre, secretary and treasurer; M. T. Goss, general manager. A plant containing a part of the machinery required has been rented.

The American Foundry Co., Toledo, capital, $10,000, has been incorporated by C. H. Mills, D. J. Nysewander, B. F. Long, M. V. Wolf and Elmer Gerson.

The Parry Machine Co., of Rochester, N. Y., has been incorporated. Capital $50,000, and directors: S. R. Parry, Clara L. Parry and W. F. Parry, of Rochester.

The Lavelle Foundry Co., of Anderson, Ind., has been incorporated. The capital stock is $15,000 and the directors are John Lavelle, B. J. Lavelle and Thomas A. Lavelle.

The Loomis-Pettibone Gas Machinery Co. was incorporated at Trenton, N. J., April 23, with an authorized capital stock of $2,000,000. The company is to manufacture engines and machinery for supplying gas and electricity. The incorporators are: Benjamin Guggenheim, New York; Burdett Loomis, Sr., Hartford; Hawley Pettibone and Burdett Loomis, Jr., New Rochelle, Conn.

The Northern Wire & Cable Co., recently incorporated with a capital of $300,000, fully paid, will at once erect a plant in Milwaukee for the manufacture of lead covered telephone, telegraph and power cable and wires. The company is now in the market for the plant's power equipment. John B. Adams is general manager, with offices in the Wells Building, Milwaukee.

Rock Hill Buggy Co., Rock Hill, S. C., is in market for horizontal return tubular boiler of from 80 to 100 horsepower.

Wm. M. Meredith, director, bureau of engraving and printing, Treasury Department, Washington, D. C., will open bids May 11 to furnish in the year beginning July 1, 1903, brass and iron castings.

Jackson Bros. Co., Whaleyville, Va., wants double-cylinder double-drum hoisting engine about 7x10, 12-inch cylinders, without boiler.

Ellisville Ice & Cold Storage Co., Ellisville, Miss., will buy a small air compressor, 1,000 feet wrought-iron water pipe, 200,000-gallon pump, machine shop outfit, including 14-foot lathe, planer, 16-inch shaper, drill press, shear and punch; also complete blacksmith outfit, wood sawing and splitting machinery.

Standard Supply Co., Wilmington, N. C., is open to handle machine tools, such as lathes, punches, boiler rollers, etc., and wants prices and catalogs on same.

At Marietta, Ga., J. Wilder Glover has organized a company, with capital of $60,000, for establishing foundry and machine shops.

The Ohio Automatic Machine Co., Oberlin, O., has been incorporated by Phil E. Milsen, A. G. Shearman, Wm. O. Bunce, T. H. Rowland and A. B. Spear.

The Fairmont Steel Co., Fairmont, W. Va., has been incorporated to manufacture and deal in steel and iron; capital, $100,000.

The Barberton Foundry Co., Barberton, O., has been incorporated with a capital stock of $10,000 by E. A. Genet, A. P. Felzlaff, Charles Guff, Louis P. Wenzel and Edward Gross Miller. The company has a site selected and will erect a foundry to handle contract and custom work.

The Fort Wayne Windmill Co., Fort Wayne, Ind., has been organized with the following officers: President, Charles Pape, Sr.; vice president, E. F. Yarnelle; treasurer, W. E. Mossman; secretary, Charles W. Cook. The company was started about a year ago on a small scale for the purpose of manufacturing a steel windmill, which has become popular, and the capital stock has been increased to $75,000. The build-

ings occupied by the company have been remodeled and equipped with modern machinery.

The Harcourt Mfg. Co., Augusta, Maine, has been organized with a capital of $60,000 for the purpose of manufacturing machinery and tools. The officers are: President, F. L. Dutton, of Augusta; treasurer, E. F. Whittum, of Augusta.

The Wegner Machine Co., of Buffalo, capital $15,000, has been incorporated. The directors are: G. A. Wegner, G. F. Mayer and Edward Simpson, of Buffalo.

The Weller Rolling Mill & Forge Co., Anniston, Ala., has been organized by citizens of Anniston and Gadsden and will operate the rolling mill formerly owned by the Anniston Rolling Mill Co. The directors of the corporation are: W. H. Weller, John T. Weller and J. H. Harden. The capital stock is $60,000.

The United States Wire Mat Co., Decatur, Ill., capital $20,000, has been incorporated to manufacture wire mats and metal goods. The incorporators are: Frank P. Welle, Charles M. Hurst, Samuel R. Gher.

The Champion Safety Lock Co., Geneva, O., has increased its capital to $50,000 from $30,000.

The Kaw City Ferry & Bridge Co., Kaw City, Texas, has been incorporated with a capital of $10,000.

The Whiting Foundry Equipment Co., Harvey, Ill., has increased its capital stock from $270,000 to $400,000.

The Howard Stove Co., Savannah, Mo., has voted to increase its capital stock to $150,000. The company was organized July 1st, 1901, with a capital of $18,000, and about a year ago increased its capital to $50,000. It is doing a good business.

Fires and Accidents:—

The Whittier Machine Co., Boston, sustained a loss of $50,000 April 21, by the burning of its brass and iron foundry.

New Construction:—

The Case Foundry & Machine Co., Kalkaska, Mich., recently incorporated with a capital of $12,000, all subscribed, has broken ground for a two-story machine shop, 24x100 feet, with wings for blacksmith shop and engine room. The foundry building will be 300x100 feet. The company expects to have its plant in operation by August 1st. Most of the machinery required has been arranged for by the purchase of a similar plant removed from another town.

The Kesselring Wheel Co., Hillsdale, Mich., will build a new plant this summer. The main building will be 60x100 feet and the foundry will be 30x50 feet.

The contract for the erection of a new Canadian Pacific Railroad machine shop at Nelson, B. C., has been let. The cost will be $10,000.

The Northwestern Steam Boiler Works, Louisville, Ky., has had plans prepared for the new building which will replace the plant burned this spring. The new plant will be much larger than the old one.

The Peerless Press Mfg. Co., Syracuse, N. Y., is building a new foundry.

The New Castle Forge & Bolt Co., New Castle, Pa., is erecting two new buildings, one 800x300 feet and the other 40x300 feet. They will be equipped for the manufacture of nuts and bolts. It is the intention of the company to increase the present capacity threefold.

The Edwin Harrington Sons Co. will erect a one-story brick machine shop, 100x197 feet, at Seventeenth and Callowhill Sts., Philadelphia. It will cost $100,000 and work will be begun May 1st.

At a meeting of the Business Men's Association, of Moline, Ill., a few days ago, Engineer J. M. Brown, who is in charge of the construction work of the extensive system of shops to be erected by the Rock Island Railroad at Moline, gave a description of the buildings. He says that the Rock Island Railroad purchased 800 acres at an outlay of $175,000, and is now engaged in the removal of some thirty houses. To prepare this ground for building it will be necessary to remove 1,500,000 yards of dirt. Ten buildings will be erected. The main structure, the machine shop, will cover 5 acres. The round house will be 400 feet in diameter with a capacity of storing forty-five locomotives. The freight car erecting room will be 160x500 feet, and every building has been planned so that extensive additions can be made conveniently. The total cost of the new plant will be $10,000,000. It is estimated that within three years 2,500 men will be employed.

The Colean Mfg. Co., Peoria, Ill., will erect a foundry building 80x80 feet, having iron beams, columns and railings, and modern equipment. Cost, $10,000.

The Great Northern Railroad will soon commence work on its new shops at Breckenridge, Minn.

Chris Gordor & Son, Devil's Lake, N. D., will build an addition to their machine shop this summer.

The Atlantic Refining Co. has obtained permits to build a machine shop 146x62, and a pump house 68x28 feet at Point Breeze, near Philadelphia. Both structures will be of brick, one story high, and with slate roof.

The Olds Motor Works, Lansing, Mich., has broken ground for the addition to its foundry which will be 70x150 feet. The plans are not complete for the other and larger building, which will be built this summer.

The Bessemer Engine Co., Marion, Ind., has been negotiating for several pieces of land on which to erect a plant for the manufacture of engines.

The Snyder & Baker Foundry Co., Belleville, Ill., will erect an addition at a cost of $4,200.

D. H. Burnham & Co. have designed for the John Mohr Co., of Chicago, a plant for coppersmithing and machinery work. The plant will be eight stories, 100x92 feet, of fire proof construction, and will cost $100,000.

The Michigan Wire Cloth Co., Detroit, has increased its capital stock from $150,000 to $175,000, and will build an addition.

The site for the plant to be built at New Castle, Del., by the Brylgon Steel Casting Co., now of Reading, Pa., has been surveyed. The main building will be 616x65 feet. It is expected bids will be called for in a few days.

The Spears Axle Works, Wheeling, W. Va., will break ground at an early date for an addition to the present plant.

Important improvements are reported in prospect for the Jenney Electric Co., of Indianapolis. The Eastern interests now in control have plans for a new shop which will probably be erected in Indianapolis and the business facilities are to be greatly increased.

Pittsburg District and Western Pennsylvania:—

The McClintic-Marshall Construction Co., Pittsburg, Pa., has been awarded the contract for the erection of all of the buildings for the Ford City Foundry & Machine Co., of Ford City, Pa. The foundry will be 200x105 feet; machine shop, 250x105 feet, and in addition there will be a blacksmith shop and pattern and pattern storage department.

The rebuilt stack of the LaBelle Iron Works, Steubenville, O., which was blown in last week has been badly damaged as the result of an explosion which wrecked the dust catcher. Repairs will be hurried, however, and it is believed that operations can be resumed shortly.

The Pittsburg & Lake Erie railroad has decided to erect a machine shop at Haselton, O., 65x115 feet, for the purpose of doing car repair work.

The Paden Iron & Steel Co. has been granted a West Virginia charter, with a capital of $100,000. The new company, which is financed by Pittsburg interests, will found the town of Paden, W. Va. Nothing can be ascertained as to the nature of the enterprise. T. A. Watkins, G. R. Wallace, Robert Miller, B. L. Hirshfield and J. B. McAdoo are the incorporators.

Bair & Gazzam, operating a machine shop at Pittsburg, have decided to increase their capital stock from $100,000 to $350,000. The increased capital is to furnish funds for the erection of an entirely new plant, a site for which was purchased some time ago. A limited amount of the capital stock is to be offered at $50 a share, par value.

The Valley Falls Coke Co., of Pittsburg, a constituent company of the Tri-State Coal & Coke Co., has been organized, with T. J. Easter, president; William Harris, treasurer, and F. M. Cain, secretary. The company has purchased 1,200 acres of valuable coking coal property at Bush Station, Taylor

County, W. Va. The coal is known as the Kanawha vein and measures 5½ feet in thickness. Plans are being prepared for the erection of a large number of ovens.

The Powell Coal & Coke Co., of Wheeling, W. Va., incorporated with a capital of $300,000, was entirely financed by Pittsburg coal and coke operators. The incorporators are: E. H. Jennings, of Jennings & Bros.; W. Y. Humphreys, president of the Bessemer Coke Co.; Herman Griffin, treasurer of the Bessemer Coke Co.; R. L. Martin, general manager of the same company; W. S. Watson, W. H. Schoen, R. Wise and W. H. Ather. The company has acquired 6,000 acres of coal land at Powell Station, Marion County, W. Va. It is probable that a battery of 600 coke ovens will be erected. The offices of the company are in the Farmers' Bank Building, with W. S. Watson in charge.

It is now reported that the deal for the absorption of the Standard Steel Car Co. by the American Car & Foundry Co. is off entirely. A meeting of the stockholders of the Standard company was held Wednesday afternoon, April 29, for the purpose of authorizing the issue of $2,000,000 worth of bonds.

The George A. Hogg Foundry Co., of Pittsburg, has purchased an extensive site at Rosslyn Station, near Carnegie, Pa. For some time this company has been negotiating for sites, but this one has been found to be the best located as to shipping facilities of all offered. The plans for the new foundry and machine shop were published in these columns several months ago. As soon as the new plant is completed it is the intention to dismantle the present plant entirely.

At a meeting of the stockholders of the Central Electric & Mfg. Co., of Youngstown, O., held last week, it was decided to purchase a number of electrical patents, the appliances to be manufactured at the company's plant to be erected at Struthers, O. The company was recently incorporated with $300,000 capital.

The Cambria Steel Co., Johnstown, Pa., has commenced the erection of five additional 50-ton open-hearth furnaces. The company now has ten furnaces of this capacity in operation. It is also probable that a new plate mill will be installed for the reason that on the present mill nothing smaller than 5-16 inch can be rolled. Plans are also said to be under preparation for two additional blast furnaces.

At the regular monthly meeting of the Engineers' Society of Western Pennsylvania, held Tuesday evening, April 21 papers on the manufacture and uses of commercial gases were presented by W. P. Flint and Alexander Gow. It was stated that $25,000,000 is being wasted annually in Allegheny County by the escape of gases from furnaces, etc. That the gas engine for operating blast furnaces would replace the present type of engine within a few years was considered not at all improbable. Fifty new members were taken into the society.

After being in continuous blast for almost eight years, Furnace A of the Riverside department of the National Tube Co. Benwood, W. Va., was blown out last week for relining and extensive repairs. The height of the stack is to be increased ten feet and a skip hoist is to be erected. The old blowing engines are to be replaced entirely. Much of the machinery is already on the ground and the work of repairing the stack will be hurried to completion.

General Industrial Notes:—

Charleston Stove Foundry, Charleston, Ill., will move its plant to Mattoon, Ill.

The Standard Machinery Co., Chattanooga, Tenn., has added a number of new machine tools to its plant. The new machinery, which cost about $11,000, will largely increase the capacity of the plant.

The city of Chicago opened bids a few days ago on cast iron water pipe to cost $30,000. The bid of the United States Cast Iron Foundry Co., $32.80 per ton, was 75 cents lower than any other bid, and $1.80 lower than last year's price.

The Philadelphia Furnace of the Sloss-Sheffield Steel & Iron Co., at Florence, Ala., which has blown in April 20th after having been out of blast since January 13th for repairs, is reported to be working nicely. The capacity of the Philadelphia is 200 tons per day. The ore comes from Russellville, Ala. The furnace was purchased on January 4th, 1900, by the Sloss-Sheffield Co. and for three years and nine days the fires never cooled and 147,742 tons of iron were produced. The company has spent about $50,000 on the improvements which have been made in the plant.

The Colorado & Southern Railroad will spend $500,000 on improvements between Cheyenne & Orin Junction, Wyoming. The improvements will consist of new steel bridges, side tracks, locomotives and cars.

The American Locomotive Co. is building fifteen locomotives at its Cooke plant for the Kansas City, Mexico & Orient Railroad.

The O. S. Kelly Co., Springfield, O., is so rushed with orders in its piano plate department that it has put 24 more molders to work.

The Illinois Wire Co. has closed its plant at DesPlaines, Ill., for an indefinite time.

The Commercial Club of Gadsden, Ala., has taken steps to secure land on which to locate another 300-ton blast furnace, to be erected by the Alabama Consolidated Co. It is understood that if sufficient land can be secured all of the plants of the company will be concentrated at Gadsden.

On a single turn of eleven hours recently the 12-inch Sylvar mill of the Republic Iron & Steel Co., of Moline, Ill., turned out 122 tons of finished product which is said to be better than any mill has ever done.

The Empire Saw Co., Albany, N. Y., has declared a dividend of 6 percent, and has elected the following officers: D. J. Hartnett, president; L. H. Burdick, treasurer; Frank Naukam, secretary.

Pawling & Harnischfeger, Milwaukee, have leased the shops lately vacated by the Nordberg Mfg. Co. These shops they will have in operation around May 1st, and, in connection with their other buildings, will place them in better position to build cranes and hoists than prevailed before the fire of the 15th. All machinery has already been purchased to equip the shops just acquired.

The Buhl Malleable Co., of Detroit, Mich., announces that after April 30 its sales in New York City and vicinity will be in charge of A. Z. Boyd, No. 56 Reade St., New York.

The Motor Truck & Vehicle Co., Columbus, O., has been in operation for the past 3 or 4 years and has been engaged in developing and building gasoline trucks and heavy passenger vehicles. The company was recently incorporated under the laws of West Virginia, and enlarged its facilities for handling business. It does not intend to build soon, as it occupies a building that at present is very satisfactory. The company will probably make additions and improvements to the plant from time to time, in the way of new machinery, or possibly build a small addition.

The Northern Engineering Works, crane builders, Detroit, Mich., report recent sales of electric traveling cranes to Lambert Hoisting Engine Co., second order; Ft. Pitt Bridge Works, fourth order; Sessions Foundry Co., Waterbury Machine Co., Union Carbide Co., Webster, Camp & Lane Co., and hand cranes to Clarage Foundry Co., Winton Motor Co., Northern Electrical Works, Elk Tanning Co., Windsor Mills, Pawtucket Foundry Co., and many other well known concerns. They report trade conditions better than during the corresponding period last year.

The Portsmouth Foundry & Machine Works, Portsmouth, O., have been making extensive improvements about the plant, adding a great deal of new machinery and in every way bettering the equipment for manufacture.

The Ohio Steel Erecting Co., Steubenville, O., recently incorporated, was organized for the purpose of erecting steel buildings and bridges, not to manufacture anything at present. Possibly later the company will build a plant for manufacturing. It expects to do a general contracting business in the line of erection, also a general repair business such as moving and rebuilding old steel structures, erecting cranes, stacks, bridges, etc.

The Gadsden Roofing & Cornice Co., Gadsden, Ala., recently incorporated, does not contemplate building at present. A new catalog will soon be issued, showing the various articles the company manufactures.

A. R. Robinson, of Alexander City, and J. W. Robinson, of Selma, Ala., will establish foundry and machine shop, but have not as yet decided on location.